OCT 21 1941

Medical Library

BRITISH MEDICAL JOURNAL

JOURNAL OF THE

BRITISH MEDICAL ASSOCIATION

SATURDAY SEPTEMBER 27 1941

PRINCIPAL CONTENTS

Rehabilitation of Injured Air Crews .. .. p. 429

Haemorrhagic Diseases of the Newborn 433

Increase of Tuberculosis in Glasgow 436

Avoidable Disability in Recent Amputations 437

Unilateral Clubbing of Fingers 439

Procedure for Gas Casualties .. 448

Leading Articles .. .. .. p. 443

Correspondence 455

Survey of Air-raid Shelters .. 451

The Changing Pharmacopoeia .. 453

Feeding the Children 454

Reviews 441

Epidemiology Section 463

Representative Conference (Supplement)

WITH SUPPLEMENT

LONDON

BRITISH MEDICAL ASSOCIATION

TAVISTOCK SQUARE

No. 4212, WEEKLY, PRICE 1/3

Copyright

REGISTERED AS A NEWSPAPER

ADSORBENT OF ALIMENTARY TOXINS

CARBACT

BRAND

ACTIVATED CHARCOAL TABLETS

FORMULA :

Activated Charcoal	3 grains
Bismuth Tribromphenate	1⅛ grains
Ext. Rhei Sicc.	⅛ grain
Excipient q.s. to	7½ grains

INDICATIONS :

All conditions due to alimentary intoxication, whether bacterial or chemical
Severe gastro-intestinal disturbances
Flatulent dyspepsia
Intestinal distension
Poisoning arising from food, vegetable and inorganic poisons
Gastro-enteritis
Diarrhœa and dysentery

AVAILABLE IN PACKETS OF 100 TABLETS

RAPID BLOOD REGENERATION

FERRAEMIA

BRAND TABLETS

FOR ANÆMIA

FORMULA :

Ferrous Sulph. Exsicc.	2¾ grains
Dried Yeast	2 grains
Copper Sulphate	1/100 grain
Manganese Hypophos.	1/32 grain
Excipient	⅛ grain
Chocolate coating q.s. to	8½ grains

INDICATIONS :

Hæmorrhagic Anæmia, Acute and Chronic
Anæmia of Pregnancy
Nutritional Anæmia
Idiopathic Hypochromic Anæmia
As a tonic during convalescence and debilitated conditions

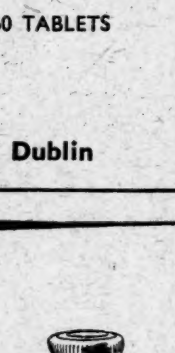
AVAILABLE IN BOTTLES OF 60 TABLETS

Manufactured in England by

WILCOX, JOZEAU & CO. LTD.,

74-77, White Lion Street, London, N.1 and at 19, Temple Bar, Dublin

THE IDEAL EFFERVESCENT SALINE



★ **The claim that the regular daily dose of a saline purgative is in some way deleterious is, of course wrong. A saline draught in the morning is trustworthy and rapid.** ★

For the prevention of constipation and also for the relief of moderate degrees of constipation, no safer and more dependable laxative can be employed than an effervescent preparation of the high standard of ENO'S 'FRUIT SALT.' The latter has been used and prescribed by many tens of thousands of doctors for over seventy years. During this time it has acquired a well-deserved world-wide reputation for purity and efficacy.

The constituents of ENO'S 'FRUIT SALT' promote *gentle peristalsis through their Osmotic Action.* and assist the expulsion of toxins from the large intestine. The bloodstream will also benefit, in that a useful portion of the dissolved salts is absorbed from the alimentary tract and slowly converted into carbonate, thus maintaining the alkalinity of the blood at a healthy level. Furthermore, a daily dose of ENO'S 'FRUIT SALT' checks any tendency to undue concentration and acidity in the renal secretions. 'FRUIT SALT' also exerts a sedative action on the gastric mucosa.

Samples and literature available on request.

J. C. ENO LTD., *MEDICAL DEPARTMENT,* **GT. WEST ROAD, BRENTFORD, MIDDX.**

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 27 1941

REHABILITATION OF INJURED AIR CREWS

BY

Flight Lieutenant R. N. HOULDING, M.B., B.S., F.R.C.S.Ed.

Medical Officer in Charge of Rehabilitation of Orthopaedic Casualties at an R.A.F. Hospital

Flying accidents are associated with peculiar injuries, many of which are rarely encountered in civilian practice. When the flight of a machine is suddenly arrested by impact with the ground it is only to be expected that those portions of the body which are in contact with or are attached to the machine will be subjected to the greatest stresses. The incidence of injuries of the feet and legs is high because they are less well protected against missiles than the rest of the body, and the small bones of the feet are liable to be fractured by impaction against the rudder-bar. In the days when machines were not fitted with safety harness the skull was often smashed against the instrument panel. The safety harness has saved many lives, but is associated with another injury—compression fracture of the spine due to hyperflexion at the level of the retaining straps. Gunshot wounds produce a number of interesting peripheral nerve lesions. Petrol has caused many cases of severe burning of the face, hands, and legs, for some of which tannic acid treatment has proved quite unsuitable. Internal derangement of the knee-joint is a frequent cause of disability, due to lesions of the menisci and of the lateral and cruciate ligaments. The treatment of these casualties aims at the restoration of complete or maximal function, and the criterion of treatment is the category of the patient when he returns to his unit. He may be fit for full operational or restricted flying duties or fit only for ground duty. Every effort is made to make him fit enough to take to the air again, and many patients who might be discharged to ground duty are kept in hospital until maximal function has been regained.

If function is to be restored in the shortest possible time muscular wasting and joint stiffness must be prevented. Union of a fracture in perfect alignment means little to a patient until he has regained the synergic activity of his muscles, and recovery from paresis of a muscle group is of little avail if the joint which it activates has become stiffened. Muscles cannot be synthesized, and their power and tone can only be regained by voluntary contraction and relaxation. Progressive remedial exercises form a basis for treatment, but the willingness of the patient to contract and relax the affected muscles at all hours of the day, wherever he may be, is the real key to success.

The value of organized rehabilitation of orthopaedic casualties has already been established by such pioneers as Mr. H. E. Griffiths at Greenwich, Dr. H. E. Moore at Crewe, and Mr. E. A. Nicoll at Mansfield. Mr. R. Watson-Jones has stressed many times the importance of rehabilitation, and his endeavours have not been without result in the Royal Air Force.

General Organization

Having received the necessary surgical treatment in an orthopaedic hospital, casualties are transferred to one of several rehabilitation centres as soon as they have recovered sufficiently to become ambulant. The rehabilitation department attached to this hospital is contained entirely within a very large gymnasium, so that, having entered, patients have no occasion to leave until the end of the morning. The keynote of treatment is activity, in the form of progressive remedial exercises and games. The onus of recovering the function of an injured part is thrown on to the patient. The nature of his lesion is explained to him simply, and he is told what to do in order to overcome it. Passive treatment in the form of massage and electricity is avoided unless definitely indicated. By recording daily the range of movement of a stiffened joint with an angle measurer, or the strength of a wasted muscle group against the resistance of weights running over pulleys, the patient becomes interested in overcoming his disability and enthusiastic over his progress (Fig. 1). Having gained his co-operation, it remains only to supervise his progress and to ensure that his activities are graduated. The progress made by every patient is recorded weekly in a folder, which has followed him from the R.A.F. hospital in which he received his initial treatment and which contains prints of the pertinent radiographs. This folder is subsequently returned to the surgeon who performed the initial operation.

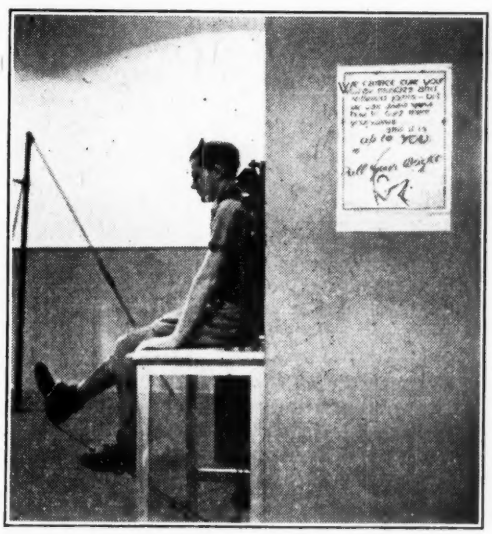


FIG. 1.—Suggestion and Co-operation! (The notice on the wall reads: "We cannot cure your weak muscles and stiffened joints, but we can show you how to cure them yourselves—and it is up to you to *pull your weight*.")

The rehabilitation department is in the charge of a medical officer, who is assisted by a physical training officer, a sergeant, and three masseuses. The department is run in close collaboration with the sports officer, who organizes all kinds of games of a competitive nature for those in

walking plasters as well as for those who are nearly fit. The gymnasium contains a small but adequate four-cubicled physiotherapy department, the medical officer's office, a milk-bar at which the patients obtain some compensation for their expenditure of energy, and cloak-rooms. The floor space, approximately ten square feet per patient, is divided into four parts: the two largest areas are used for the general remedial classes and for special remedial exercises, the third area is used for skittles and other games, and the fourth is opposite the milk-bar and contains chairs and tables at which the patients may rest.

Every orthopaedic patient performs at least two sessions of special remedial exercises, mostly of a non-weight-bearing character, under individual supervision by a masseuse. When muscular tone is regained he joins the "nearly fit" class, in which he performs general remedial exercises of a muscle-developing nature and swimming, in addition to his special exercises, which he is encouraged to perform at every opportune moment throughout the day. Finally he graduates to the "fit" class and participates in all organized activities. The general remedial classes are run concurrently and last for three-quarters of an hour. They are followed by a ten-minutes rest interval and then by competitive games such as skittles and volley-ball; both classes then adjourn to the swimming-bath.

During the afternoon golf, tennis, swimming, and volley-ball tournaments are arranged by the sports officer, who is advised as to what each patient should and should not do. It is not always appreciated that dancing has considerable remedial value.

Occupational therapy is not employed to any great extent, since it is considered that more improvement is made in the early stages of treatment by encouraging the patient to concentrate on overcoming his disability by working away at it all day long. In the later stages the patient's attention is diverted from his injured part by participation in competitive games. Patients do not undergo vocational training whilst at this hospital.

The Need for Individual Supervision

In the words of Dr. Moore: "A certain percentage of injured persons will work out their own salvation after receiving the necessary surgical treatment, with little or no help and without any special prolongation of incapacity. However, there will always be quite a fair percentage who will require something more if they are not to drift and greatly prolong their disabilities. This is due to many causes, of which the chief are failure to get over their earlier difficulties, all kinds of retarding psychological factors, apathy, a desire to escape return to their former duties, and so on. Consequently individual supervision of their progress is an essential part of their treatment."

A patient who is left to his own devices after receiving surgical treatment will quite naturally be fearful of exerting too much activity rather than too little. It is therefore most important that he should realize that the function of a plaster cast is not to prevent him from using an injured part but to enable him to use it to the greatest extent that is compatible with immobilization of the fracture. If the plaster is properly applied and remains intact it will immobilize the fracture whatever the patient may do. Supervision is necessary to ensure that the plaster does remain intact and comfortable and that the patient does make frequent use of every joint which is not necessarily immobilized.

Manipulation and arthrotomy are followed by effusion into the joint and surrounding tissues, and if the effusion is allowed to persist adhesions and wasting will develop rapidly. By means of teaching the patient to contract the muscles which activate the affected joint before the operation, and by ensuring that he contracts them at frequent and regular intervals after the operation, the duration of incapacity is considerably shortened. Wasting and loss of tone of the quadriceps femoris muscle is of common occurrence and is apt to be associated with pain and effusion in the knee-joint if the patient performs too violent weight-bearing activity. This is because the lateral ligaments of the knee-joint were never intended to withstand strains in a mechanical sense but to evoke increased tone in the quadriceps muscle whenever they are subjected to tension. Should the quadriceps, "the guardian of the knee-joint," be weakened, the lateral ligaments may easily be stretched and cause effusion and pain, which is liable to keep the patient awake at night and is to be distinguished from stiffness on awakening, which wears off with exercise. Without supervision a patient with wasted thigh muscles may either be fearful of exerting sufficient activity to regain the strength and tone of the quadriceps or may exert too much weight-bearing activity, so that in either event the vicious circle of wasting and effusion will become chronic and incapacity is unnecessarily protracted. With supervision excessive muscular wasting is avoided and, by restricting activity to non-weight-bearing exercises until muscular tone is regained, the period of incapacity is minimal.

It is most important to treat the patient as well as his lesion and to ferret out any "fears" which he may hide in the back of his mind. A careless statement such as "he will never fly again," if overheard by the patient, may greatly retard his progress by destroying his will to recover. Daily observation of progress engenders optimism, and the progress made by others, in addition to suggestion by posters and by the staff, ensures co-operation from the patients. Compulsion is seldom necessary, and is avoided to the greatest possible extent because it tends to evoke an attitude of obstinate resistance. Before discharging a patient to flying duties it is important to ensure that he has regained confidence in his ability to perform all normal activities. A patient who has regained full movement and muscular tone after excision of the patella may yet be fearful of running. Encouragement and participation in competitive games will overcome this natural phobia.

Physiotherapy

Physiotherapy is of great value for selected cases. It is a form of passive treatment and as such is given sparingly, because some patients are only too happy to lie at their ease on a couch and receive treatment which, for remedial purposes, is a poor substitute for their own activities. Warmth facilitates the movement of any joint by inducing hyperaemia and relaxation, and the only problem is how to direct the heat where it will do most good. A hot bath, a radiant-heat cradle, and a diathermy set each have their particular uses, but in the rehabilitation department only radiant heat is used to loosen up stiffened joints before starting remedial exercises. Faradism is used only to assist a patient to acquire the knack of contracting muscles that are very much wasted, and once he has learnt to do this the faradism is discontinued, because it is considered better to avoid passive treatment and to encourage the patients to regain muscular strength and tone by their own exertions. Galvanism serves to reassure a patient with a peripheral nerve lesion that the paretic muscles will still contract, and is also of some value for the dispersal of static congestion. An experienced masseur is able to loosen muscular adhesions by deep massage, but this treatment is seldom necessary if the patient has contracted his muscles at regular and frequent intervals throughout any period of necessary immobilization.

Patients perform their remedial exercises under the supervision of a masseuse, and this arrangement is found to be more satisfactory than to use a specially trained physical training instructor for exercises and restrict the masseuses to physiotherapy, because otherwise certain patients will tend to evade the physical training instructor for more pleasurable treatment at the hands of the masseuse. It is probable that masseurs are more suitable for the treatment of non-commissioned ranks, but I believe that masseuses are better able to obtain the co-operation of young officers.

Fractures

For the purpose of rehabilitation, patients with fractures fall into two groups—those who are uniting and require immobilization, and those who have united and require remedial treatment to restore the strength and tone of their muscles and the movements of their joints. Obviously effective treatment of the first group will minimize the treatment required by the second group and will curtail the period of incapacity.

There is no really practical method of hastening the union of a fracture, and a month or a year may pass before union is sound, but this period can be minimized by completely immobilizing the fragments and stimulating their blood supply by muscular contraction. Incomplete immobilization must retard union by shearing across the developing callus which bridges the gap between the fragments. Repeated shearing of the callus will lead eventually to sclerosis of the bone ends, which is the cause of established non-union, and the pseudarthroses which reside on the shelves of our pathological museums.

To immobilize a fracture of the shaft of a long bone it is necessary to fix the joints at each end of the bone in a degree of flexion sufficient to prevent rotation occurring between the fragments. Complete immobilization of a fracture can only be ensured by internal fixation with a bone graft or a plate, and it is probable that a plaster cast alone seldom effects complete immobilization because of the interposition of soft tissues between the plaster and the bone. Union of a fractured tibial shaft may be slightly delayed when treated in an above-knee walking plaster; nevertheless if the patient walks properly, rocking from the heel on to the forefoot and pushing off with his toes, there will be a minimal amount of muscular wasting and stiffness when the plaster is discarded. This is because venous drainage from the dependent limb is maintained by intermittent muscular contraction, and static congestion, which causes partial anoxaemia, rapid muscular wasting, and adhesion formation, is prevented. In the treatment of any fracture just as much attention should be paid to the soft tissues as to the fracture. For movement is effected by muscles: the bones form only a frame, and our object is to restore function.

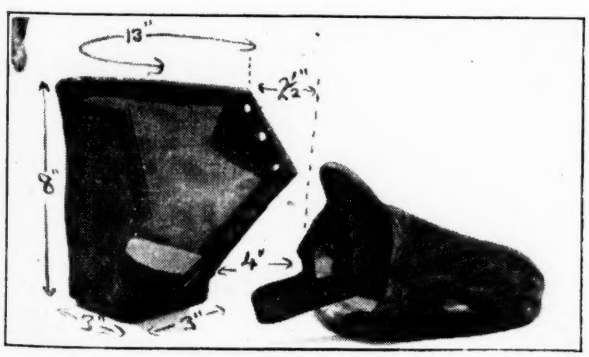


FIG. 2.—Walking-heel and toe-cap used to adapt a leg plaster for walking purposes. This heel affords sufficient stability for the patient to be able to balance on his injured limb, and encourages heel-toe movement.

To adapt a leg plaster for walking purposes our practice is to use a wooden heel, which is laced on to the plaster by means of a canvas "spat," and a toe-cap (Fig. 2). The heel is hollowed out on its upper surface, to which is glued a layer of half-inch sorbo rubber. The heel and toe-cap are standardized so that they may be used on almost any plaster. They enable a patient in a below-knee plaster to walk so naturally that a casual observer would not notice anything wrong with him; and if the heel of an above-knee plaster is raised with a three-quarter-inch plaster slab before applying the walking-heel, and the heel of the shoe on the sound leg is raised with a three-quarter-inch wooden block, the patient is able to walk without sticks or crutches with an almost natural gait (Fig. 3). Unlike the walking-iron, the wooden heel affords sufficient stability for the patient to be able to balance on his injured limb. This stability gives him confidence and encourages him to rock forwards on to the toes instead of pivoting his foot outwards on the stud of the iron as he steps forwards. Attention to the detailed construction of a walking plaster is well repaid, because if a patient actively contracts the flexor muscles of his toes while walking and is able to walk without limping muscular wasting and stiffness are minimal when the plaster is discarded and function is rapidly regained. Several weeks of incapacitation of a patient who is being treated in an above-knee walking plaster may be prevented by mobilizing the knee-joint two weeks before discarding the plaster. This is not done by replacing the above-knee by a below-knee plaster, but by reinforcing the anterior part and cutting away the posterior part of the above-knee portion of the plaster so that the patient is able to sit and swing his leg, thereby regaining flexion movement. For walking, the plaster is bound to the thigh with a crêpe bandage. So long as the knee-joint is splinted in the flexed position no rotation can occur at the fracture. After discarding the plaster full movement of the knee-joint is regained by non-weight-bearing exercises, flexion and extension, rowing and bicycling, until the strength and tone of the quadriceps muscle are regained. Full movement of the tarsal joints and ankle-joints is usually regained within a week as the result of walking and remedial exercises, and the patient is not discharged until his calf muscles are

FIG. 3.—Activity!

powerful enough for him to be able to raise himself on to his forefoot without assistance.

After discarding a walking plaster the extremity of the limb will become swollen during the daytime unless the soft tissues are supported by an elastic or some other kind of bandage, and this tendency to swell will persist until sufficient tone is regained in the calf muscles to maintain the venous circulation of the limb. This is explained to the patients, and they are instructed to avoid standing and always to elevate the limb when sitting so that it drains by the action of gravity. Congestion is the prelude to adhesion formation, and while it persists muscular tone will not be regained. This is but one reason why it is important to maintain the tone of the calf muscles throughout any period of necessary immobilization.

Compression fracture of one or more vertebral bodies, as the result of hyperflexion of the spine, is a common injury among air crews who have crashed. Many of these cases are unassociated with injury to the spinal cord, and the patient is able to walk away from the site of the crash, although he complains of a constant aching pain in his back. Cases that require transportation should be rolled on to a stretcher and carried flat, because hyperextension of an injured cervical spine may cause dislocation, and hyperflexion of the lumbar spine may increase the compression. Compression fractures can usually be decompressed by the pull of the anterior longitudinal ligament which occurs with hyperextension of the spine by the two-table technique. Comminuted fractures can usually be realigned very satisfactorily by this method, but they unite slowly and extension should be maintained for at least five months in a Watson-Jones plaster jacket. Neurological examination often reveals symptoms referable to root compression in cases of compression fracture of the spine. These symptoms are relieved by extension of the spine but will recur if immobilization is discontinued too early. Premature mobilization of a fractured vertebral body may be followed by progressive wedging and absorption of bone. No harm is done by unnecessary immobilization of the spine provided that the tone of the musculature is maintained, but premature mobilization may produce chronic symptoms.

Activity is an essential part of the treatment of these patients throughout the period of immobilization. Extension exercises are performed daily and a progress chart is kept of the weight which each patient is able to raise over a pulley by extending his spine. If the fracture is firmly consolidated and the power and tone of the back muscles are maintained, these patients are able to return to flying two weeks after discarding their spinal jackets.

Manipulation

Manipulation is of value for increasing the range of a stiff joint that has become stationary and for relieving the symptoms in a joint that gives rise to pain at one extreme of its range of movement.

Manipulation of a stiff joint is indicated only when the surgeon is satisfied that as the result of his own unaided activities the patient is unable to gain any increase in the range of movement of the joint and that the joint has not been subjected to any form of passive stretching. The manipulation should be performed under full surgical anaesthesia, so that the muscles are completely relaxed and the surgeon is able to feel the resistance which he has to overcome. The operation should not be performed until the adhesions have become crisp and avascular so that they snap easily and are followed by a minimal amount of reaction, and manipulation should therefore not be repeated at intervals of less than two months. No matter how great the discomfort the patient should begin active unaided movements of the joint as soon as he has recovered sufficiently from the anaesthetic, and should repeat these movements at hourly intervals. He should retain 75% of the increase gained under anaesthesia and recover the remainder subsequently.

Flexion of the knee-joint may be limited by adhesions between the patella and the femur, in which case manipulation of the joint will very probably fracture the patella; the latter should be mobilized before manipulation is attempted. Before manipulation a stiff joint should be radiographed to exclude bony block. Every effort is made to obtain at least 90 degrees of flexion of the knee-joint, and radio-ulnar movement is absolutely essential for the management of an aircraft.

Manipulation of a joint in order to relieve pain at one extreme of its range of movement should not be attempted unless the manipulator has an intimate knowledge of the normal movements, both voluntary and involuntary, of the affected and neighbouring joints. Adhesions resulting from prolonged stasis are usually broken down by the patient's own activities, but occasionally pain may persist which can be localized to one joint and one particular movement. Focal infection, if present, should be eradicated before manipulation is attempted.

Derangement of Joints

The stability of any joint is dependent upon two factors —the shape of the articular surfaces and the strength and tone of the muscles which activate the joint. Dislocation of the shoulder-joint is a not uncommon injury among air crews. This joint depends almost entirely for its stability upon the strength and tone of the muscles which surround it, and unless the tone of these muscles is fully restored dislocation is liable to recur. A surprisingly large proportion of these injuries are associated with nerve lesions, due presumably to the violence of the dislocating force. The knee-joint is sometimes dislocated. One patient who ruptured the internal lateral ligament and both cruciate ligaments regained 100 degrees of flexion movement and the joint was completely stable unless he was caught off his guard, so that he was able to run and to play games, and this was because he regained excellent tone and great power of the quadriceps femoris muscle. Rupture of the external lateral ligament is sometimes associated with injury to the common peroneal nerve.

Decrease in the range of movement of a joint by shortening of muscles or their tendons may arise from prolonged splinting. This may result in flexion of the fingers when the wrist-joint is extended. The wrist must be stabilized by a plaster splint, and the fingers can then be slowly extended by the pull of elastic which is stretched between a wire frame and stalls worn on the fingers (Fig. 4). The

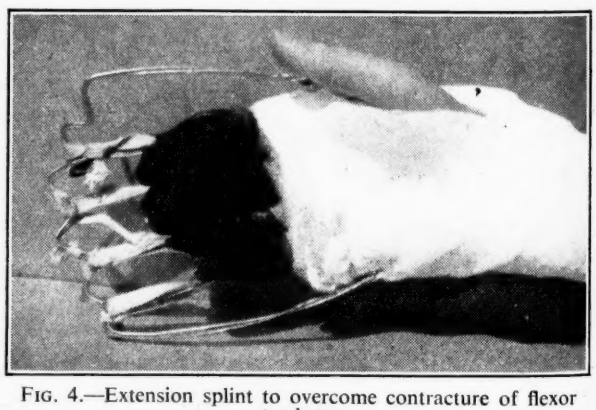


FIG. 4.—Extension splint to overcome contracture of flexor tendons.

patient is encouraged to flex the fingers at frequent intervals against the pull of the elastic, and as he relaxes the flexor tendons are stretched.

The After-treatment of Burnt Hands

The rehabilitation of patients with burnt hands requires much patience and perseverance. Provided that the tendons and joints of the fingers have not been destroyed, the degree of recovery that is possible may exceed all expectation. The first thing is to assure the patient of this, and the second is to see that he works away at his stiff joints all day long. Whatever the initial treatment has been after burning, the skin is usually very thin and tender and sweats profusely. The stiffness is due to general adhesion formation around the tendons and joints of the fingers, and is caused by the initial reactionary oedema. The fingers are usually straight as the result of splinting. Movement is regained by immersing the hand in olive oil or in paste made with fuller's earth, which is heated to a temperature of 110° F. for two sessions of fifteen minutes daily. The patient is encouraged to squeeze a piece of rubber sponge or a ball while his hand is being heated. For the rest of the day he wears a detachable splint which dorsiflexes his wrist, and a glove to the finger-tips of which are attached lengths of elastic that are tied around a hook in the splint (Fig. 5). The constant pull of the elastic tends

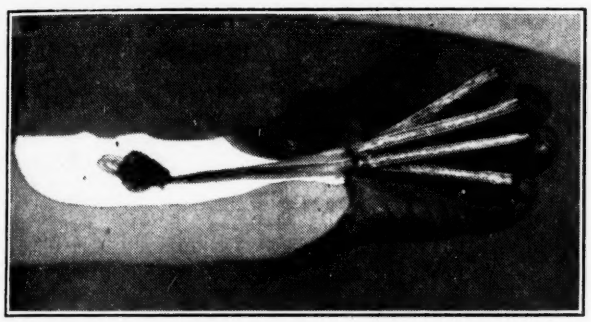


FIG. 5.—Flexion splint to overcome stiffness after burning.

to flex the fingers, and the patient is encouraged at all times to oppose this by extending them. Treatment may take many weeks, but to regain the use of a hand justifies any amount of trouble.

Summary and Conclusions

In this paper the principles underlying the rehabilitation of injured air crews are described. Orthopaedic casualties are transferred to a rehabilitation centre after having received necessary surgical treatment in an orthopaedic hospital. Some of these would probably work out their own salvation without further supervision, but others would certainly prolong their incapacity unnecessarily. These casualties are therefore kept under almost constant supervision in order to restore maximal function and make as many as possible fit for further flying duties, and also to curtail incapacity.

Each patient is studied individually, for with his co-operation graduated remedial activity will restore function more rapidly than any form of passive treatment. Muscular wasting and stiffness, associated with immobilization, are prevented to a great extent by active contraction. A fracture is no reason for neglect of the soft tissues.

The criteria by which successful rehabilitation is judged are: first, the category of the patient on returning to duty; and, secondly, the time that he takes to regain function. Figures are as yet inconclusive, but 16% more patients were discharged to flying duties during the first six months that this department was working than during the six months before it opened.

TREATMENT OF HAEMORRHAGIC DISEASE OF THE NEWBORN*

BY

A. I. S. MACPHERSON, M.B., Ch.B., F.R.C.S.Ed.

Clinical Tutor, Royal Infirmary, Edinburgh; Crichton Research Scholar

The recognition of extreme prothrombin deficiency as by far the most frequent cause of spontaneous haemorrhage in the newborn and the discovery that vitamin K is essential for the maintenance of the normal plasma prothrombin level have raised to the status of a specific deficiency disease what had perforce been accepted as a mishap which "occurs without apparent reason" (Tallerman, 1937). Previously the only positive findings had been the report of Whipple (1913) that he had seen no prothrombin in a specimen of blood obtained after death from a fatal case of neonatal haemorrhage, and the observation that the clotting time tended to be prolonged for the first five days of life, returning to normal about the tenth day (Rodda, 1920). The treatment of haemorrhagic disease was correspondingly vague, the earlier clinicians advising local application of styptics, and, in the case of bleeding from the cord, even encircling the umbilicus with a deep suture. Injections of gelatin solution and of whole blood intramuscularly were introduced about the same time. This latter measure, despite the early recognition that spontaneous recovery from the haemorrhagic state occurred often enough to make its therapeutic value doubtful (Schloss and Commiskey, 1911, 1912), is still widely used as a routine treatment.

In the severer cases there has been general agreement that blood transfusion is a more efficacious procedure. The introduction of vitamin K, and more especially of vitamin K analogues, into clinical practice, and the demonstration of the rapid elevation of the prothrombin index which follows the administration of these substances to the newborn (Macpherson *et al.*, 1940), suggested another and apparently specific line of treatment for haemorrhagic disease, the successful use of which has already been reported in Europe and America (Nygaard, 1939; Waddell and Guerry, 1939; and others).

Since profound hypoprothrombinaemia is now recognized as the characteristic abnormality of the blood in haemorrhagic disease of the newborn, it follows that the efficacy of any method of treatment can be measured by its capacity (1) to raise the prothrombin content of the plasma so rapidly that the haemorrhage stops in a short time; and (2) to maintain the prothrombin at so nearly a normal level that the haemorrhagic tendency does not recur.

This communication reports an attempt to evaluate by these standards the merits of intramuscular injection of whole blood, blood transfusion, and injection of vitamin K analogues as treatment for haemorrhagic disease of the newborn.

Method Used

All prothrombin estimations have been made upon capillary blood by a modification of the method evolved in this hospital (Innes and Davidson, 1941) and found to give results closely comparable to those obtained by methods requiring the use of venous blood (Quick *et al.*, 1935; Ziffren *et al.*, 1939). The test has been performed as originally described except that (1) the oxalated blood has always been diluted with four times its own volume of saline; (2) the solutions have been kept at a constant temperature; (3) the lecithin-venom solution described by Hobson and Witts (1940) has been preferred, as it was

* Part of the expenses of this investigation has been defrayed by a grant from the Earl of Moray Endowment.

found to give a more definite end-point for the lower values of prothrombin. All results have been expressed as the "prothrombin index" (Illingworth, 1939) and charted as percentages of normal.

The Investigation

Ten cases of true haemorrhagic disease of the newborn have been treated by injection of whole blood into the buttock, by blood transfusion, or by injection of vitamin K analogues. The results of each line of treatment are reported in the first three sections below. Two cases of icterus gravis (erythroblastosis foetalis) also developed spontaneous and persistent haemorrhages, the treatment of which is briefly recorded in the fourth section.

1. Intramuscular Injection of Whole Blood

Intramuscular injection of whole blood has been employed in three cases. The effect upon the prothrombin index and upon the haemorrhagic manifestations is shown in Figs. 1, 2, and 3.

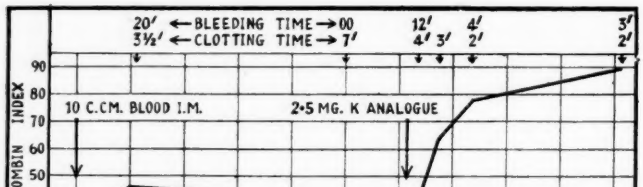


FIG. 1.—Case 6531.

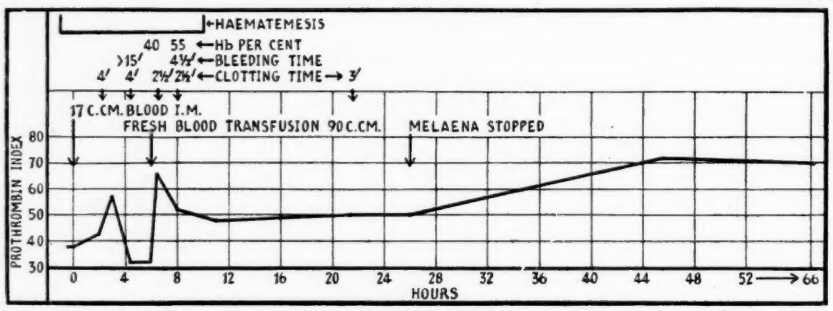


FIG. 2.—Case 6780.
Correction: 55 haemoglobin should be over 2½′ and 66.

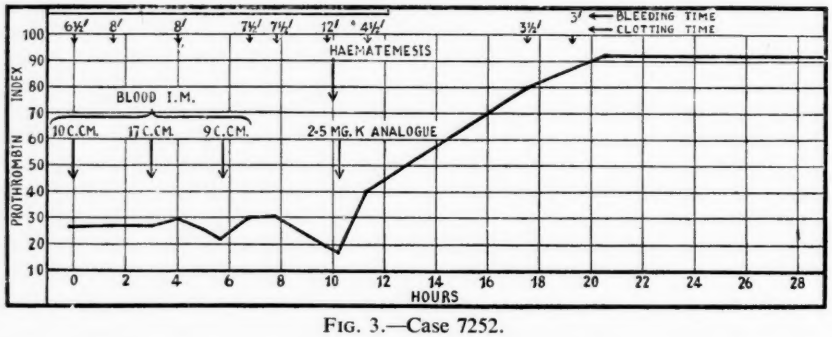


FIG. 3.—Case 7252.

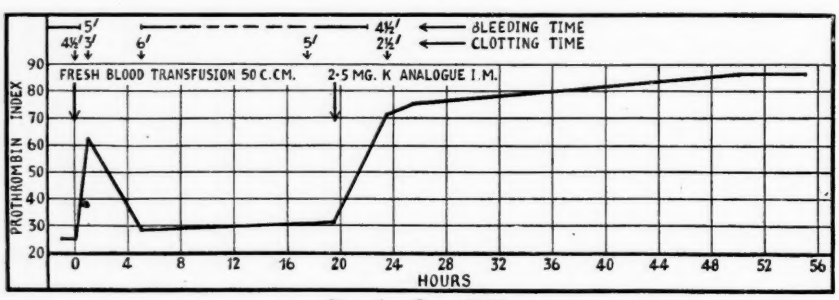


FIG. 4.—Case 6947.

Case 6531.—Primipara. Normal labour (duration 21 hours); spontaneous delivery. Birth weight, 6½ lb. Birth condition satisfactory. Haematemesis (red and altered blood) at 32 hours of age. 10 c.cm. whole blood into buttock. Clinical condition did not improve. Haematemesis continued till further treatment with vitamin K analogue was given twenty-five hours later.

Case 6780.—9-para. Prolonged inert labour (duration 60 hours). Spontaneous delivery. Birth weight, 5¾ lb. Put to breast. Haematemesis at 24 hours of age, followed by melaena. 17 c.cm. whole blood into buttock at 32 hours. Bleeding continued with increasing pallor, so that transfusion was required at 38 hours.

Case 7252.—Primipara. Occipito-posterior position requiring manual rotation and later forceps, both under anaesthesia. 76½ hours' labour. Birth weight, 8¼ lb. Glucose-saline followed by one feed of breast milk and water āā 1 oz. Haematemesis first occurred at 32 hours of age. Gastric lavage 10 hours later gave return of frank blood. 10 c.cm. whole citrated blood into buttock at 49 hours, 17 c.cm. at 52 hours, and 9 c.cm. at 55 hours. Four hours later haematemesis recurred, the clotting time was found to have risen to 12 minutes, and the prothrombin index had fallen to a level lower than it had been before treatment. Bleeding had persisted from heel-stab throughout this time, but stopped two hours after the injection of vitamin K analogue intramuscularly (see below).

The elevation in the prothrombin index obtained by the intramuscular injection of whole blood has proved to be so slight and so transient that only in Case 6531 did it even temporarily affect the course of the haemorrhagic disease. Moreover, in Case 7252, in which repeated injections were given, the temperature was raised to 101° F. or over during the ensuing thirty-six hours and both buttocks were tense and painful. The risk of this procedure in less favourable surroundings is obvious.

2. Blood Transfusion

Two cases have been treated by whole fresh blood transfusion (Figs. 2 and 4).

Case 6780 (continued).—So much blood had been lost from the alimentary canal that haemoglobin was 40% at 38 hours. 90 c.cm. of whole blood transfused into superior sagittal sinus. Approximately an hour later haemoglobin was 55% and prothrombin index 66, and all superficial bleeding had stopped. The last vomit of altered blood appeared 90 minutes later, and melaena lasted till approximately 56 hours. Cyanosis and restlessness were pronounced after the transfusion, the latter being controlled only by repeated doses of chloral.

Case 6947.—Primipara. Assisted breech delivery after 36 hours' labour. Melaena appeared and oozing from abrasion on scrotum began at about 90 hours of age. Transfusion of 50 c.cm. whole blood into superior sagittal sinus at 96 hours. Bleeding stopped at end of transfusion, but recurred 5 hours later and persisted (soaking the dressings applied) for 12 hours till further treatment was given (see below).

Both cases were characterized by a rapid improvement in the prothrombin index and by the early cessation of bleeding. In both, however, subsequent readings showed an almost equally rapid fall in the prothrombin index. This fall was arrested in Case 6780, a level (about 50%)

above the bleeding threshold persisting for about twenty hours before further, apparently spontaneous, elevation occurred. To this case a very large transfusion (approximately one-third of its own blood volume) had been given. In Case 6947, in which the estimated blood volume was about five times greater than the volume of blood transfused, the prothrombin index fell almost to its original level and bleeding recurred five hours after the transfusion had been given.

3. Injection of Vitamin K Analogues

Vitamin K analogues have been given by injection to six cases (Figs. 1, 3, 4, and 5). Fig. 5 shows the effect obtained clinically and upon the prothrombin index by intramuscular injection of 2.5 mg. of 2-methyl-1:4-naphthoquinone in oil (B), and by intramuscular injection of 5 mg. (A) and the intravenous injection of 2.5 mg. of water-soluble 2-methyl-1:4-naphthohydroquinone disuccinate (C). In each instance bleeding was controlled within about two hours. The prothrombin index curves show a rapid and remarkably parallel rise to a high level, which was subsequently maintained throughout the whole of the neonatal period. So far as can be judged, intravenous injection does not produce better results than deep intramuscular. It is important to give the oily solution deeply, as too superficial an injection will promote irritative local lesions.

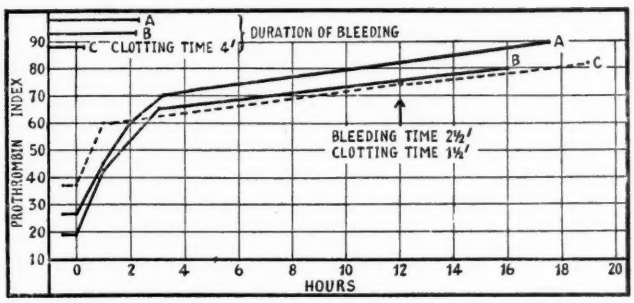


FIG. 5.—A = Case 5754. B = Case 5551. C = Case 6765. (For description see text.)

Case 5754.—Primipara. Easy 10-hour labour with spontaneous delivery of 4¼-lb. child following medical induction for pre-eclamptic toxaemia. Clinical jaundice with pale faeces appeared on fourth day and steadily deepened. Bleeding from heel-stab persisted from 156 to 165½ hours. 5 mg. 2-methyl-1:4-naphthohydroquinone disuccinate given by intramuscular injection at 163 hours. Clotting activity remained at normal despite the following findings: Faecal fats—total, 33.7%; split, 29.7% of total. Icteric index, 333. Laevulose tolerance test: 30 min., 6 mg. per 100 c.cm.; 60 min., 6 mg.; and 120 min., 7 mg. Died at 264 hours, apparently from hepatic dysfunction.

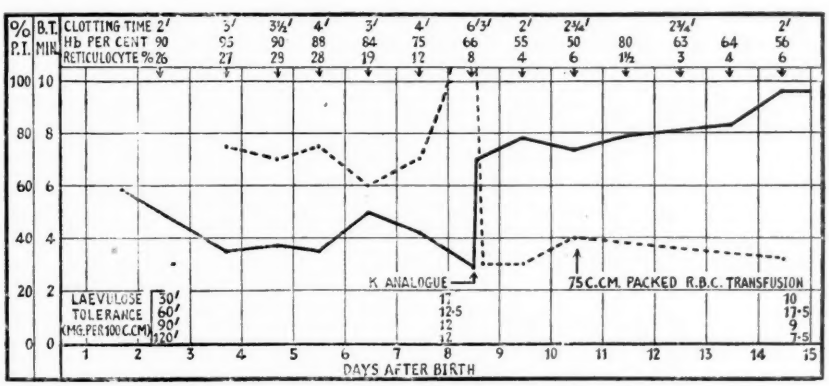


FIG. 6.—Case 7152. Broken line = bleeding time (B.T.). Continuous line = prothrombin index (P.I.).

Case 5551.—Classical Caesarean section of election for hypertension. Birth weight, 9¼ lb. Birth condition satisfactory. Persistent ooze from heel-stab began at 29 hours. Intramuscular injection of 2.5 mg. 2-methyl-1:4-naphthoquinone at 31 hours led to cessation of bleeding two hours later.

Case 6765.—6-para. Normal labour (duration 11 hours). Spontaneous delivery. Birth weight, 5¼ lb. Copious melaena first noticed at 54 hours of age. Intravenous injection 2-methyl-1:4-naphthohydroquinone disuccinate at 71 hours. No further fresh bleeding. Melaena persisted for further 20 hours, suggesting a bleeding-point high in the intestinal tract.

In three cases (Figs. 1, 3, and 4) vitamin K analogues were given after haemotherapy had failed to control haemorrhage or to raise and maintain the prothrombin index. In each instance an immediate and lasting response was obtained both clinically and in the level of the prothrombin index—an effect too rapid to be influenced by any concomitant tendency to spontaneous recovery, and in marked contrast to the results of the other methods tried. In three other cases which have been treated by injection of 2.5 mg. of 2-methyl-1:4-naphthoquinone the prothrombin index estimations have been made less frequently than in the cases already recorded. In each instance, however, frank bleeding stopped in a short time and the prothrombin index rose to and remained at normal or nearly normal levels (see Table).

Table showing Prothrombin Index

Case No.	Before Vitamin K	After Vitamin K	
		Less than 12 hours	Less than 24 hours
6295	35	70	78
6633	24	—	85
6912	33		65

4. Icterus Gravis

Two cases of icterus gravis showed spontaneous haemorrhages which were treated successfully by the intramuscular injection of 2.5 mg. of 2-methyl-1:4-naphthoquinone in oil. The prothrombin index and certain other details of Case 7152 are charted in Fig. 6.* From the therapeutic point of view the interesting feature is the rapid and sustained effect given by vitamin K analogue even when a laevulose-tolerance test indicated a considerable depression of liver function.

Discussion

In spite of the proved effect of vitamin K in increasing the clotting activity of blood in such a way that spontaneous bleeding ceases in a very short time, it has been authoritatively stated that the administration of adult blood intravenously or by repeated intramuscular injections not only is a safer measure for general use but gives "results . . . among the most striking in therapeutics" (*Lancet*, 1940, 1941). Clearly the very small and fleeting response even to the repeated injection of adult blood into the buttocks can be instrumental in controlling the haemorrhagic tendency only when the prothrombin index is already rising spontaneously. Moreover, repeated injection of so much blood is not devoid of danger. Blood transfusion in the newborn is a procedure that can be undertaken only in hospital, and even there may be followed by untoward

* These cases will be recorded in more detail later by Dr. J. L. Henderson, to whom I am grateful for the reticulocyte and haemoglobin estimations.

reactions. The evidence from two cases treated by transfusion supports the observation that even when a comparatively large volume of blood is given to an adult the effect upon the clotting activity is transient (Stewart, 1939). It appears from Case 6947 that when a transfusion of average volume is given the immediate effect upon the prothrombin index is dramatic (more rapid, though more limited, than can be obtained from the injection of vitamin K analogue alone). Unless, however, this early rise is supported by concurrent spontaneous restoration the prothrombin may fall to its original level and bleeding recur in a very few hours.

The prompt and maintained increase in the plasma prothrombin and the rapid control of haemorrhage (within two hours of administration where bleeding was superficial) after the injection of vitamin K analogues are manifestly quite independent of any coexistent tendency to spontaneous recovery. Moreover, 2.5 mg. of 2-methyl-1:4-naphthoquinone intramuscularly restored the prothrombin index and maintained it at adult levels even when the laevulose-tolerance test indicated deficient hepatic function (Case 7152). The site of injection (intravenous or intramuscular) has no effect upon the rapidity of action, and there is no material difference between oil-soluble and water-soluble preparations. The simplicity of this method and the extreme rarity of conditions in which vitamin K analogues will not be effective in arresting the haemorrhagic tendency suggest that one of them should be employed first in all cases of spontaneous and persistent bleeding in the newborn. It is probable that in the most severe cases, in which prolonged or massive haemorrhage is exsanguinating the patient, simultaneous treatment by transfusion and injection of vitamin K analogue should be given. The rapid action of the transfusion in elevating the haemoglobin and plasma prothrombin levels would then be reinforced by the slightly slower and much more sustained effect of the vitamin K analogue on the clotting activity of the blood.

I am much indebted to Dr. E. McCallum, who has helped me with the prothrombin estimations in several of the cases described; and to Dr. J. L. Henderson for his interest in bringing some of these cases to my notice and for his assistance in other ways. Also I wish to thank Dr. W. F. T. Haultain, Dr. Douglas Miller, Prof. R. W. Johnstone, and Prof. Charles McNeil, who have given me every facility to carry out these investigations on the cases under their care. I am indebted to Glaxo Laboratories Ltd. and to Roche Products Limited for generous supplies of vitamin K analogues.

REFERENCES

Hobson, F. C. G., and Witts, L. J. (1940). *Lancet*, **2**, 247.
Illingworth, C. F. W. (1939). Ibid., **1**, 1031.
Innes, J., and Davidson, L. S. P. (1941). *British Medical Journal*, **1**, 621.
Lancet, 1940, **1**, 650.
Ibid., 1941, **1**, 250.
Macpherson, A. I. S., McCallum, E., and Haultain, W. F. T. (1940). *British Medical Journal*, **1**, 839.
Nygaard, K. K. (1939). *Acta obstet. gynec. scand.*, **19**, 361.
Quick, A. J., Stanley-Brown, M., and Bancroft, F. W. (1935). *Amer. J. med. Sci.*, **190**, 501.
Rodda, F. C. (1920). *Amer. J. Dis. Child.*, **19**, 269.
Schloss, O. M., and Commiskey, L. J. J. (1911). Ibid., **1**, 276.
—— —— (1912). Ibid., **3**, 216.
Stewart, J. D. (1939). *Ann. Surg.*, **109**, 588.
Tallerman, K. H. (1937). Eden and Holland's *Manual of Obstetrics*, p. 615, London.
Waddell, W. W., and Guerry, D. (1939). *J. Amer. med. Ass.*, **112**, 2259.
Whipple, G. H. (1913). *Arch. intern. Med.*, **12**, 637.
Ziffren, S. E., Owen, C. A., Hoffman, G. R., and Smith, H. P. (1939). *Proc. Soc. exp. Biol.*, N.Y., **40**, 595.

The borough of Chelmsford, with an estimated population of 33,040, reports twenty-eight deaths of children under 1 year during 1940, and only ten deaths among young persons between 1 and 25 years. An attempt was made to establish a day nursery for children between 2 and 5, but the scheme had to be abandoned, chiefly owing to the difficulty of bringing and collecting children in the black-out, and of obtaining money, staff, and accommodation. The M.O.H. notes a good response to the diphtheria immunization campaign, and only three cases were reported during the year, with no deaths.

THE CAUSES UNDERLYING THE RECENT INCREASED INCIDENCE OF AND MORTALITY FROM TUBERCULOSIS IN GLASGOW

BY

STUART LAIDLAW, B.Sc., M.D., D.P.H., D.P.A.

AND

DUNCAN MACFARLANE, M.B., Ch.B., D.P.H.

(From the Public Health Department, Glasgow)

Pulmonary Tuberculosis

It would appear that for five years preceding the outbreak of war in 1939 the incidence of and the mortality from pulmonary tuberculosis were tending to stabilize themselves in Glasgow at figures of around 1,650 notifications and 960 deaths per annum. During the first year of war the returns under the above two headings were 1,908 and 1,177 respectively, a rise of approximately 250 notifications and 200 deaths. This increased incidence and mortality is being maintained during 1941.

The following table shows the total number of notifications and deaths from pulmonary tuberculosis during the past seven years, together with a forecast for 1941 based on the returns for the first half of the year:

Year	Notifications	Deaths	Year	Notifications	Deaths
1934	1,646	873	1938	1,748	960
1935	1,757	972	1939	1,574	972
1936	1,647	979	1940	1,908	1,177
1937	1,654	955	1941*	2,190	1,342

* Estimated figure—i.e., twice the notifications and deaths during the first half of 1941.

The seasonal incidence of notifications from pulmonary tuberculosis for the years 1939, 1940, and 1941 was studied when it was found that the graphs for 1940 and 1941 followed closely the path of the graph for 1939, but at a slightly higher level. It was observed that the rise in notifications during 1940 and 1941 was normally distributed throughout the year, and did not occur in any one particular season.

The age and sex distribution of the notified cases of pulmonary tuberculosis for 1939 and 1940 are tabulated below:

Age	Males			Females		
	1939	1940		1939	1940	
— 5 years	34	47		21	40	
—15 ,, ...	68	45		50	71	
—25 ,, ...	237	287		341	437	
—35 ,, ...	162 } 529	218 } 669		162 } 503	214 } 651	
—45 ,, ...	130	164		72	82	
—55 ,, ...	119	127		42	27	
—65 ,, ...	79	79		25	26	
65 ,, ...	23	31		9	13	
Total	852	998		722	910	

The total number of notifications was 1,574 in 1939 and 1,908 in 1940. During the first half of 1941 there were 1,095 notifications and 671 deaths—figures that indicate that the disease is continuing to increase in incidence.

It will be seen from the table that the increased incidence has taken place almost entirely between the ages of 15 and 45 in males and 15 and 35 in females, and that both sexes show an all-round increase of 20% over the 1939 returns.

Non-pulmonary Tuberculosis

The comparative figures for non-pulmonary tuberculosis for 1939 and 1940 also show that a considerable rise in the number of notifications and deaths from this form of tuber-

culosis had occurred in the latter year. The relative figures were: 561 notifications and 255 deaths for 1939, and 669 notifications and 329 deaths for 1940. It will be seen that the increase, approximately 17%, in this group is slightly lower than among the pulmonary cases.

The following table subdivides the notified cases of non-pulmonary tuberculosis into their particular types.

Year	Abdomen	Spine	Hip	Other Bones and Joints	Genito-urinary	Skin	Lymph Glands	Meninges	Multiple
1939	82	39	39	88	29	21	90	137	2
1940	80	60	37	101	38	18	130	184	4

From this it is seen that the spine, the meninges, and the lymph glands have shown the greatest increase in tuberculosis, while other sites have remained relatively unaffected. It was considered worth while to extract the age and sex distribution of the meningeal cases in order to discover which age groups were chiefly affected. It was found that the increase occurred in children of both sexes under 5 years, and to a lesser extent in females aged 15 to 25.

Possible Reasons for the Increased Incidence

It is evident from the above details that there must have been some factor in 1940 which was not present in 1939, or, if present, was intensified in 1940. The possible reasons for this increase are considered under separate headings.

(*a*) *Increased Virulence of the Tubercle Bacillus.*—The figures show that the notifications and deaths during 1940 increased in equal ratio, but there is no proof that the bacillus has become more virulent.

(*b*) *Malnutrition and Deficient Diet.*—This is not an important factor in the increased incidence of tuberculosis, for the following reasons: (1) The State has controlled the distribution of essential foods in such a way that each individual obtains a fixed minimum quantity of basic foodstuffs sufficient in itself to maintain the normal person in good health. (2) It can be presumed that if deficiency of diet was the main factor the various age groups would be affected equally when expressed on a percentage basis, whereas from the tables it has been seen that the maximum rise occurred in the 15-45 age group. This group comprises the workers, many fewer of whom were unemployed, and who on account of higher wages were able to feed themselves well.

(*c*) *Tubercle Bacilli in Milk.*—This may be considered a factor in producing some of the additional cases of tuberculosis affecting the lymph glands, but the fact that the number of cases of abdominal tuberculosis has remained stationary indicates that it cannot be the main reason for the increased incidence among non-pulmonary cases.

(*d*) *Examination by Military Medical Boards.*—These examinations have undoubtedly revealed some unsuspected cases of tuberculosis in the age group 20-35, but the number of cases so notified is not nearly comparable to the actual increase.

(*e*) *Exertion or Strain of Army Life.*—That the unaccustomed rigours of Army life have not been a dominant factor in the increase among males during 1940 is shown by the fact that the number of civil notifications in that year exceeded the total returns for 1939.

(*f*) *Long Hours in Shelters.*—This may cause a slight increase in the number of registered cases, but it is obviously of minor importance. Raids in Glasgow have been so infrequent that shelters have not been occupied to any considerable extent, and only a very small percentage of the population frequent them when there is no warning.

(*g*) *Overcrowding in Factories.*—Were contact infection in factories an important feature, one would have anticipated a proportionately greater percentage increase among pulmonary as compared with non-pulmonary tuberculosis—in fact, the increase is roughly 20% in each case.

(*h*) *Long Hours, Overwork, Strain, and Curtailed Rest.*—It has been noted that the main increase involved the age groups 15-45 in males and 15-35 in females. This is the period of maximum working activity, when long hours of overtime are often undertaken. It must also be remembered that many a period normally devoted to rest or recreation has now to be sacrificed to fire-watching or Home Guard duties. In addition to this we have ascertained that young adults of both sexes are frequenting dance halls and picture houses with great regularity, and in numbers as high as, if not higher than, before the outbreak of hostilities. The significance of the rise in the 15-45 group in males becomes even more apparent when one realizes that the number of civilian males in this age group in 1940 has been considerably depleted by the calls of military service.

In the case of females the institution of marriage and the ties of family life necessitate a shorter working life among large numbers. This would account for the drop in female notifications at an earlier period than with males—a fact that is confirmed by the following tables of occupations:

	1939	1940
Pre-school children and scholars	173	165
Military class	35	71
Professional class	24	30
Commercial class	218	211
Domestic class	309	321
Miscellaneous	121	208
Tradesmen, Unskilled workers, Skilled workers, Labourers	674	932

Our conclusion, therefore, is that it is a combination of long hours, overtime, strain, and ill-spent leisure which is the factor producing the rise in the number of cases of tuberculosis, and it may be assumed that the increase will be at least maintained so long as these factors remain unchanged.

AVOIDABLE DISABILITY SEEN IN RECENT AMPUTATIONS

BY

W. R. D. MITCHELL, M.Ch.(Orth.), F.R.C.S.Ed.
Orthopaedic Surgeon, Emergency Medical Service; late Ministry of Pensions

Since the present war began many publications have appeared on the subject of amputation. The multiplicity of advice given renders difficult the choice of procedure for those with little or no experience upon which to draw. It is not the object of this paper to criticize individual methods of amputation, but simply to draw attention to certain types of case in which different operative technique and after-care would have resulted in speedier recovery with less disability. At the present stage it is impossible to evaluate some of the newer methods, but it is not too early to point out that procedures are still being employed which have already been condemned by examination of the results of the amputations performed in the last war. All the patients forming the basis of these observations have been seen in one of the special hospitals after primary amputation in Army or Emergency Medical Service units.

As amputation below the knee presents the greatest number of difficulties and comprises a large proportion of all amputations, the causes of prolonged disability will be

PROLONGED DISABILITY IN AMPUTATIONS BELOW THE KNEE

Cause	*Effect*
1. Bad design of skin flaps	(*a*) Healing by secondary intention with or without terminal low-grade osteitis.
	(*b*) Painful scar.
	(*c*) Intertrigo from loose folds.
	(*d*) Late breakdown.
2. Skin grafting of bare areas	Stump will not stand artificial limb.
3. Too early re-amputation	Post-operative sepsis.
4. Failure to use skin traction in guillotine amputations	(*a*) Pain and misery.
	(*b*) Loss of length at re-amputation.
5. Failure to use post-operative splintage (applies especially to knee)	Flexion deformity.

considered in detail in relation to this stump. The various headings will also be found to cover, to some extent, disability in relation to other amputation stumps.

Skin Flaps

No blame can be attached to the surgeon when the injury does not permit of planned flaps, but numbers of almost identical stumps have been seen where the design leaves no doubt that they have been planned as such. An example is the use of equal lateral flaps, giving an antero-posterior scar. This fashion has been recommended in a recent publication on war surgery because of the better drainage afforded. Good drainage is unquestionably advisable, but methods must surely be employed which do not cause additional disability. The objection raised to equal lateral flaps in amputation below the knee is the occurrence of a scar on the subcutaneous part of the tibia. In the post-operative period failure to heal by first intention exposes the tibia and adds many additional weeks to hospital treatment. Should the scar heal by first intention it is still placed at the point of maximum pressure between the end of the tibia and the socket of the prosthesis when the leg is swung forward in walking. Late breakdown may occur, especially if the scar is adherent to the bone.

It is not with these late complications that we are most concerned, but with those stumps that have not yet healed and show a small area of apparently dead bone projecting from the end. Radiographs of these stumps may eventually show terminal sequestration, but only after many months of waiting. Re-amputation below the knee while the wound is still open is impossible without risk, as the majority only measure six to seven inches below the knee. When the wound has healed or almost healed with a thin covering of scar tissue, re-amputation, with removal of one inch or more of bone, may enable the surgeon to cover the stump with sound skin flaps. To allow a patient to be fitted with his prosthesis when the stump end is covered only by scar tissue is to lay the foundations of trouble and disappointment. Therefore re-amputation, though wasteful of time, is necessary in order to provide a serviceable stump. It is hoped that the practice of using equal lateral flaps for amputations below the knee will rapidly disappear.

Another type of flap, the long anterior, which has been the standard textbook recommendation for many years, is still seen in recent amputations. Fortunately its use appears to be on the wane, for it has proved to be one of the least desirable flaps on account of its poor blood supply. Necrosis of the skin at the distal part of the flap may be a post-operative complication, but is not nearly so serious as necrosis of the skin overlying the tibia. The problem presented by ulceration of part of the flap over the tibia is exactly similar to that described in connexion with the antero-posterior scar. As Verrall has stated, the ideal scar, from the point of view of both skin nourishment and limb-fitting, is secured by the use of short anterior and long posterior flaps.

A number of stumps are still found with too generous a skin covering, and require the removal of superfluous skin before the artificial limb can be worn in comfort. This is a minor operation and adds little to the total disability period, but it deserves mention because some patients, already fitted with limbs, have had troublesome intertrigo from infolding of the skin or friction in the socket. Skin flaps should be tailored neatly on the stump at the time of amputation. If this is done there will be fewer possible sites for haematoma formation with the attendant risk of sepsis, and the time necessary for shrinking the stump will be lessened. The ideal stump is, of course, firm and tapering to the end, with rounded contours and a minimum of flabby tissue.

Skin Grafting

Although skin grafting has been performed on a few occasions the results have been unsatisfactory. Re-amputation, as soon as sepsis will allow, has been the only method of securing a serviceable stump. Various types of free graft and the tube pedicle graft, transferred in two stages from the abdomen, have been done. The Thiersch graft is not strong enough to stand the wear of the socket, and the whole-thickness grafts encountered so far have been so irregular with scars in vulnerable positions that limb-fitting was out of the question. Patients who have undergone several operations for grafting, with a long pre- or post-operative period of stump dressing, are naturally disappointed when informed that re-amputation is necessary.

Guillotine Amputations without Skin Traction

Too many cases of this type have been seen ; the patient's misery is so real and so unnecessary. In the rush and hurry inseparable from this form of amputation time is really saved by taking a few seconds longer to cut through the skin at a lower level than the other structures. Two or three sutures can then be inserted over a generous gauze pack. This method is quicker than the application of skin traction with a weight over the end of the bed, and is effective for all but the very rare case in which it is desired to keep open the whole area of cross-section for drainage purposes. Skin traction has been applied at a late stage with little success. Three to four inches have often been lost at re-amputation in the thigh, while the loss in the lower leg has usually been less.

Too Early Re-amputation

Patients who have already undergone re-amputation have been received with discharging amputation stumps. It does not seem to be fully appreciated that re-amputation of two to three inches of a stump which is septic or has been septic is a procedure fraught with considerable danger of post-operative sepsis. With a clear five inches or more the risk is less. Stumps should be healed, or almost healed, before re-amputation is performed, and it is advisable to allow the patient to be up and about before the operation in order to activate latent sepsis, which otherwise might make its appearance at the time of operation or later. Ideally, before operating on the patient in whom every inch is of importance, the surgeon should wait for healing by scar tissue and a period of massage and heat to test for latent sepsis, but in view of the time involved operation may sometimes be considered a justifiable risk when the bare area appears really clean without a trace of surrounding oedema or tenderness. After all, re-amputation is a plastic operation done at leisure, and the result is usually of much greater importance than the excision of a facial scar, which has so much time and care lavished on its performance by plastic surgeons.

Flexion Deformity at Knee or Hip

This is one of the most easily avoided disabilities connected with amputations in the lower extremity, yet it is surprising how often it is encountered when the patient is sent for limb-fitting. Knee-joints are safe from this deformity if bandaged to a back splint for the healing period, but in amputations above the knee the hip-joint must be inspected to see that extension remains full. Ward routine should preclude the possibility of the stump resting on a pillow. Flexion deformity of either hip or knee is a serious disability, and its complete correction is an extremely difficult problem. In fact, if the deformity has lasted for more than a few weeks it is unlikely that it can be entirely cured.

A CASE OF UNILATERAL CLUBBING OF THE FINGERS

WITH A SUMMARY OF THE LITERATURE

BY

R. EWING RODGERS, M.D., M.R.C.P.

Medical First Assistant, Sheffield Royal Infirmary

The first observer to describe this rare condition was Ogle in 1859. Others to describe and collect cases were Béclère (1901), Castex and Mazzei (1939), Groedel (1907), Hatzieganu (1923), Högler (1920), Loucaides (1932), Mendlowitz (1938), Pigney (1920), Souques (1919), and Walsh and Alldredge (1934). A case observed recently is now described.

Case History

A male quarry worker aged 54 was admitted complaining of pain in the right arm and a lump on the right side of the neck for six months. At first the lump was not painful, but it gradually increased in size and pain occurred, first in the right upper arm and later in the forearm. The patient also noticed a change in the shape of his fingers. There was no cough or dyspnoea, and no history of syphilis was admitted.

FIG. 1.

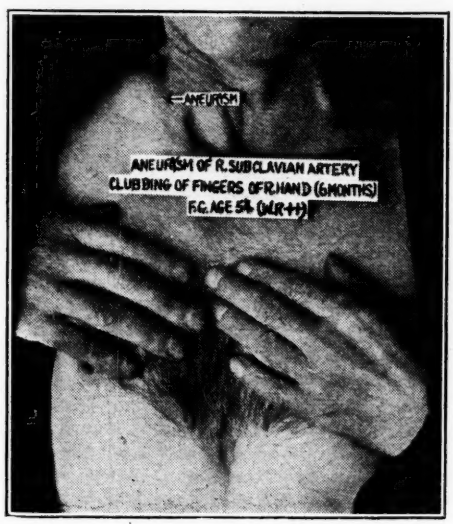


FIG. 2.

On examination a pulsatile swelling, 2½ by 2¾ inches, was seen just above the right clavicle; a systolic thrill and murmur were present over the swelling. There was pitting oedema and venous engorgement of the right upper limb. The right hand was constantly warmer than the left. There was pronounced finger clubbing of the right hand and curvature of the nails; the left hand was normal (Fig. 1). The power in the right upper limb was poor compared with the left (the patient was right-handed). The sensation and reflexes were normal in both arms, and the circumference of the arms 3 inches above the elbow was: right 8½ inches, left 9 inches (measured after oedema had subsided with rest and one month's treatment). The pulse at the right wrist was less forceful than that at the left. Blood-pressure readings were: right arm 118/84; left arm 124/88. The heart showed no enlargement clinically, but there was a systolic murmur over the aortic area. The pupils reacted to light and accommodation; the knee-jerks were present. No tracheal tug was observed. The sedimentation rate (Cutler) was 25 mm. in one hour, and the Wassermann reaction was strongly positive. Radiographs showed: (1) extensive soft-tissue shadow above the right clavicle, but nothing abnormal in the chest; (2) slight decalcification of both hands, right greater than left; (3) slight decalcification of bones of right forearm.

The case was diagnosed as syphilitic aortitis, with right subclavian aneurysm and secondary unilateral clubbing of the fingers of the right hand; and rest, potassium iodide, and mercury were prescribed. Later bismostab 0.2 gramme was given weekly. The aneurysm gradually decreased to about three-quarters of its original size, and the oedema and much of the pain and venous dilatation disappeared.

The patient, when seen six months later, had voluntarily discontinued treatment for three months; his aneurysm was much larger, and the clubbing more pronounced (Fig. 2). He has recently been operated on successfully, the aneurysm having been tied off both distally and proximally. It is too early to assess any change in the clubbing, but all his symptoms have disappeared.

Discussion

Clubbing of the fingers occurs bilaterally in various conditions, chiefly in cardiac and pulmonary disease. Other states, such as cirrhosis of the liver, ulcerative colitis, sprue, amoebic dysentery, and post-thyroidectomy myxoedema, occasionally present clubbing (Mendlowitz, 1938). It therefore seems difficult to deduce a single cause, and circulatory, chemical, and nervous factors may all play a part.

Cases reported in the Literature

Reporter	Observer	Accompanying Lesion
Béclère (1901)	Béclère	Aneurysm of R. subclavian artery
Castex and Mazzei (1939)	Castex and Mazzei	Innominate and R. subclavian aneurysm
,,	,,	Aneurysm of L. subclavian artery
Groedel (1907)	Groedel	Aneurysm of descending arch—compression of L. subclavian artery
,,	Bernhardt	Aneurysm of L. subclavian artery
,,	Berent	,, ,, ,, ,,
,,	Ogle	Aneurysm of R. subclavian artery
,,	Canton	Aneurysm of subclavian artery
,,	Thomas Smith	,, ,, ,, ,,
,,	Osler	Intrathoracic aneurysm (exact site not given)
,,	,,	,, ,, ,, ,,
Hatzieganu (1923)	Hatzieganu	Aneurysm of R. brachio-cephalic trunk
Högler (1920)	Joachim	Aneurysm of aortic arch
,,	Ebstein	Aneurysm of R. subclavian artery
,,	Klausa	Old dislocation of shoulder
,,	Forster	Aneurysm of aortic arch and subclavian artery
,,	Hatiegan	,, ,, ,, ,,
Loucaides (1932)	Loucaides	,, ,, ,, ,,
Mendlowitz (1938)	Mendlowitz	R. subclavian aneurysm
,,	,,	Aortic aneurysm
,,	,,	Phlebectasia
,,	,,	Carcinoma of R. upper lobe bronchus
Pigney (1920)	Pigney	Dilatation of ascending aorta and aortic arch
,,	De Jong	Bullet which passed through axillary vascular region. No exact details of lesion
,,	Baur	Aneurysm of L. subclavian artery
Souques (1919)	Souques	Phlebectasia
Walsh and Alldredge (1934)	Walsh and Alldredge	Aneurysm of R. innominate artery
,,	Barney Brooks	Aneurysm of R. axillary artery
,,	Stanley Smith	Aneurysm, site unquoted

Of the 29 cases of unilateral clubbing of the fingers reported in the literature, 24 occurred with aneurysms, chiefly of the subclavian arteries (see Table). In the remaining 5 pressure was observed on the vessels and nerves of the affected limb. This pressure seems to be the only factor common to all the 29 cases, but it is not clear whether it was on the arteries, veins, nerves, or lymphatics, or on a

combination of these, as the clinical signs accompanying the clubbing varied considerably. In the case reported above there was, clinically, obstruction of the vessels as shown by oedema, venous dilatation, pulse, and blood pressure. Subsequently, pressure on the nerves gave rise to pain.

Ogle (1859) thought that the clubbing was due to the presence of an increased amount of venous blood in the affected limb and that this was caused by interference with the axillary circulation. Other observers thought it was due to interference with the sympathetic nerves running with the vessels, but as it is now known that sympathetic nerve fibres do not run down the whole length of the arteries this theory seems untenable.

Mendlowitz (1938) investigated the circulation in the arms of 4 cases of unilateral clubbing and found no evidence of a circulatory cause. He compared the maximum heat elimination and blood pressure gradient from brachial to digital areas in both the normal and affected arms and found that no significant changes in the blood flow had occurred in the affected finger-tips. However, only 4 cases were investigated, and the results of the experiments were not very conclusive. Local anoxaemia due to circulatory embarrassment still remains a very probable cause of clubbing.

Chemical causes, such as toxaemia, seem very probable when bilateral cases are considered. Thus, bronchiectasis, a disease with general toxaemia, is commonly accompanied by bilateral clubbing. However, if general toxaemia were always the cause, unilateral clubbing should never occur. There remains the possibility that the localized pressure, for instance from an aneurysm, might precipitate incipient clubbing on one side, and that the other side might eventually show clubbing if the patient lived long enough. It is interesting to note that cases of an aneurysm causing pressure and pronounced clubbing in one hand have sometimes shown slight clubbing of the other hand (Béclère, 1901 ; Hatzieganu, 1923). It seems unlikely that pressure on the nerves of the arm could be the cause of clubbing, as although nervous symptoms are common in unilateral cases they do not occur in bilateral cases.

Finally, it may be noted that in 2 of the reported cases the clubbing disappeared wholly or partially after operation on the aneurysm (Hatzieganu, 1923 ; Högler, 1920). This is convincing evidence that pressure is the primary factor in unilateral cases. Local circulatory embarrassment follows this pressure, causing anoxaemia and, hence, probably the clubbing. Anoxaemia from circulatory embarrassment or general toxaemia in bilateral cases may well account for the clubbing, so conforming with the final factor in unilateral cases.

Summary

A case of unilateral clubbing of the fingers is described.

The cases previously reported are tabulated.

The difficulty of explaining the exact causation is stressed and the possibilities are discussed.

I wish to thank Prof. E. J. Wayne for permission to publish this case, and Dr. L. C. D. Hermitte for the photographs.

REFERENCES

Béclère, A. (1901). *Bull. Mém. Soc. méd. Hôp. Paris*, 3 ser., **18**, 284.
Castex, M. R., and Mazzei, E. S. (1939). *Bol. Acad. nac. Med.*, B. Aires, p. 457.
Groedel, T. (1907). *Münch. med. Wschr.*, **54**, 216.
Hatzieganu, J. (1923). *Bull. Mém. Soc. méd. Hôp. Paris*, 3 ser., **47**, 403.
Högler, F. (1920). *Wien. Arch. inn. Med.*, **1**, 35.
Loucaides, L. (1932). *Z. klin. Med.*, **121**, 724.
Mendlowitz, M. (1938). *Clin. Sci.*, **3**, 387.
Ogle, J. W. (1859). *Trans. path. Soc. Lond.*, **10**, 103.
Pigney, A. (1920). *Thèse Paris*, No. 262.
Souques, A. (1919). *Bull. Mém. Soc. méd. Hôp. Paris*, 3 ser., **43**, 186.
Walsh, G., and Alldredge, R. H. (1934). *Sth. med. J.*, **27**, 545.

Medical Memoranda

Cirrhosis of Liver and Perforated Gastric Ulcer in an Infant of 6 Months

The only type of infantile cirrhosis which I can trace in medical literature is one which occurs in India. It was first described by Twining in 1832, and its morbid anatomy was investigated by Gibbons in 1891. A full account of this disease is given by Sir Upendranath Brahmachari and Phanindranath Brahmachari in volume 8 of the *British Encyclopaedia of Medical Practice*. I can find no record of a similar condition in this country, nor of any case in which the terminal event was a perforated gastric ulcer, though Brahmachari refers to gastric and intestinal haemorrhage as a common complication. A non-syphilitic cirrhosis, originating as an intralobular and progressing to a multilobular cirrhosis, occurring in an infant of this age and terminating in a perforated pyloric ulcer at 6 months must be very uncommon in this country ; and if the brother's liver was also cirrhotic the condition must be, as in the Indian cases, familial. Two other children appear to be healthy.

CASE RECORD

A male child aged 5½ months was sent to me by Dr. Bruce of Newport. The history was that he weighed 9 lb. at birth, and that, beyond a somewhat intense icterus which persisted for some days, the puerperium was normal. It was found, however, that the infant did not thrive on the breast. Dried milk preparations did not result in improvement, and on these the stools were fatty in appearance. On sweetened condensed milk he thrived for a time, but on resuming dried milk he lost weight. It was found that the liver was very large, extending to the umbilicus. No free fluid was detected in the abdomen, and there was no enlargement of the spleen. There had been no jaundice since the neo-natal period. A former child of the same family had also had a much enlarged liver, and had died of pneumonia at 2 years of age. A provisional diagnosis of von Gierke's (glycogen) disease was made.

The blood sugar was first investigated. The fasting blood sugar was 100 mg. per 100 c.cm. ; one hour after a feed of 5 oz. ostermilk it was 225 mg., and after two hours 160 mg. Next the effect of adrenaline was observed, for in von Gierke's disease this drug does not raise the blood sugar. On this occasion the fasting blood sugar was 140 mg. ; 5 oz. of adrenaline 1 in 1,000 raised this to 160 mg. The urine contained glucose and acetone. The blood count was: red cells, 3,700,000 per c.mm. ; haemoglobin, 80% ; white cells, 12,400 per c.mm. (polymorphs 29%, lymphocytes 70%, large mononuclears 1%). The Wassermann reaction was negative. I concluded that this was not a case of von Gierke's disease, but a true diabetes mellitus with hepatomegaly, and decided to try the effect of 3 units of soluble insulin twice a day. On the second day the infant suddenly collapsed and died at 11.15 a.m.—four hours after his third dose of insulin. Just before death he passed a quantity of blood per rectum. At no time did he seem to have any pain.

Post-mortem Examination.—The abdomen contained about 8 to 10 oz. of cloudy fluid. The liver had the typical appearance of multilobular cirrhosis. On raising the liver I discovered the cause of the cloudiness of the fluid in the abdomen, for a perforated ulcer of the pylorus on the greater curvature was exuding partially digested milk, and this, mingling with the straw-coloured ascitic fluid, produced the turbid appearance. The small and large intestines were full of blood. The spleen was normal in size. The liver weighed 22 oz. The pathological report on the liver was as follows: "Sections show considerable cirrhosis ; this is to some extent of multilobular type, but numerous delicate fibrous bands are seen surrounding most of the individual lobules, and conforming more to a biliary (Hanot's) cirrhosis, though there is no evidence of active bile-duct regeneration."

My thanks are due to Dr. Bruce for his account of the history of this case, and to Dr. Douglas Thornton for his report on sections of the liver, as also to his staff for pathological investigation.

L. FIRMAN-EDWARDS, M.D.Cantab.,
Hon. Physician, Royal I.W. County Hospital.

Ryde, I.W.

Reviews

THE SCIENTIFIC ATTITUDE TO LIFE

The Scientific Attitude. By C. H. Waddington. Pelican Books. (Pp. 126. 6d.) Middlesex: Penguin Books, Ltd.

In 1932 an eminent man of science wrote: "Not meddling with morals and politics; such I would urge is the normal condition of tolerance and immunity for scientific pursuits in a civilized State. . . . Science should remain aloof and detached, not from any sense of superiority, not from any indifference to the common welfare, but as a condition of complete intellectual honesty." We do not give the writer's name as he has doubtless changed his mind, since the events of subsequent years have proved the inadequacy of such a point of view. Science can no longer remain aloof, impartially dispensing material comfort with one hand and methods of destruction with the other. A scientific training should imply a scientific attitude to life. All too obviously this has rarely been the case in the past, and a scientist's opinion on matters outside his subject has often been not worth much more than that of a film star on politics.

The younger generation of scientific workers, to their honour be it said, are intensely interested in the impact of science on the outside world, and Dr. C. H. Waddington, himself a researcher of repute, has attempted to define his views on what the scientific attitude to life should be. He tells us that his little book originated from discussions at the club which produced the Penguin Special *Science in War*. It reads like a rough draft of his ideas, but he modestly states that a number of his friends laughed him out of the "more excruciating absurdities" of that draft. It is to be wished that those friends could have helped him in other ways, for there is a lack of lucidity and a disregard of the niceties of the English language which hamper the effectiveness of this obviously sincere work. This is not surprising, as much of the author's thought seems to be still in a state of fermentation. Penetrating beneath the froth of this ferment we read his main thesis to be a rejection of the plea that science is and must be ethically neutral. He maintains that a scientific attitude to the world does not in the slightest deny the emotional effects produced on men by their experience: what it tries to do is to classify the mechanisms by which these effects were produced. Man is the only animal to discover the secret of getting results in the material world, which is to let one's actions be governed by an objective analysis of the situation. Our task is to enable this analysis to get results when applied to politics. The author is critical of both Fascism and Communism, though he clearly inclines to the left. He realizes that his plea for the application of conscious control to the economic functioning of society, which he regards as a step forward in evolutionary progress, will meet with opposition, for with Wilfred Trotter he recognizes that people object strongly and irrationally to anything which touches a part of their personality that is out of order. Science can satisfy the other side of man's nature which demands a belief in some authority, a thrill of romance. Science can not only satisfy reason, but he believes it could also provide this thrill and this authority; it is able to provide mankind with a way of life which is, in the first place, self-consistent and harmonious; and, secondly, free for the exercise of that objective reason on which our material progress depends. It is all to the good that many of our younger men of science are devoting so much thought and energy to the difficult problems that lie ahead, but they will do well to remember that authorship, like the laboratory, has its special technique.

HISTOLOGY FOR MEDICAL STUDENTS

Textbook of Histology for Medical Students. By Evelyn E. Hewer, D.Sc. Second edition. (Pp. 364; illustrated. 17s. 6d. net.) London: William Heinemann (Medical Books) Ltd. 1941.

The writing of textbooks for medical students on special subjects has become, with the advance of knowledge, an increasingly difficult task, since the time allotted for the study of such subjects in the already overburdened curriculum is very short. Dr. Evelyn E. Hewer has overcome this difficulty with much success, and has contrived to accentuate those points which are essential; and, also realizing the desirability of giving some indication of the meaning of the various morphological features which are described, she has introduced supplementary notes of practical importance, bearing upon the relation of certain changed appearances in cell structure to phases in the life-history of the cell, functional activity, certain diseased conditions, and changes due to the mode of fixation or staining of the tissue. A considerable number of new and excellent photomicrographs have been added to those of the preceding edition, and also some new schematic drawings. The latter, however, in our opinion are capable of improvement in their technique, this being scratchy and of a blackboard type. One would like to have found in this book a more adequate description of the central nervous system and also of histogenesis, the latter of which may be regarded as having the same fundamental relation to histology and general pathology that general embryology has to anatomy and surgical pathology. The general neglect of this study has hitherto led to the perpetuation of certain initial errors, and more particularly with regard to the structure of some of the connective tissues. This is obviously due to the failure of many writers to appreciate the full meaning of some well-established facts—such as the formation in the early stages of implantation of the ovum, of continuous multinuclear plasmodial strands, and the primary continuity of mesenchymal tissue in the embryo—upon the formation of corresponding structures in the adult body—for instance, chorion epithelioma and many forms of connective tissue. The book, however, is well written and contains much new and interesting matter, and it will well serve its purpose—namely, an introduction to the study of histology for medical students.

CARLOS FINLAY AND YELLOW FEVER

Carlos Finlay and Yellow Fever. By Carlos E. Finlay, M.D., F.A.C.S., Professor of Ophthalmology, University of Havana. Edited by Morton C. Kahn, M.A., Ph.D., Sc.D. (Pp. 249. 21s. net.) Published under the auspices of the Institute of Tropical Medicine of the University of Havana by the Oxford University Press, New York.

So far back as 1881, long before anything was known of the insect transmission of disease, Carlos Finlay put forward his hypothesis of the transmission of yellow fever by the mosquito, based on what was known of the epidemiology and pathology of the disease. In later years he added more and more cogency to the reasoning by which this view was upheld. He even selected as the vector the species of mosquito that we now know does convey the disease. At a time when practically nothing was known of mosquitoes in the Tropics Finlay bred and studied *Aëdes aegypti*, at that time the *Culex* mosquito. He also carried out feeding experiments, using this mosquito, with the view of transmitting the mild disease and so bringing about protective immunity to the person bitten. In regard to such experiments one can only say that at the time they did not carry complete conviction, so that it was nearly twenty years later before the results of the U.S. Army Yellow Fever Commission showed with certainty that yellow fever was conveyed by the mosquito and not by aerial contamination or fomites. Nevertheless Finlay in 1893, long before the first operations

were undertaken against yellow fever by the destruction of mosquitoes, advocated such measures, along with protection from bites of infected mosquitoes as the essential action necessary in the prevention of yellow fever.

These remarkable facts have recently been vividly brought to the reader's attention in a book by his son, Carlos E. Finlay, giving an account of Finlay's family and personal life and the researches which led to his mosquito theory. This is told not as a formal history but in the intimate detail of an observer behind the scenes. Incidentally the book gives an informative picture of the whole progress of research on yellow fever from the early observations to the more recent discoveries, together with what is known as a result of historical research of the origin of this once dreaded disease. It is well documented, and authentic dates and references are given throughout. It forms an important contribution to the history of our knowledge of tropical diseases.

Notes on Books

Your Health in Wartime: A Doctor Talks to You, by Dr. CHARLES HILL, is published at 1s. by the University of London Press. This little book is a revised version of a series of broadcasts given last January, with the addition of a section on food. In simple yet attractive style suitable for children of school age Dr. Hill deals with such topics as the way germs spread and how the body defends itself against them, touching lightly on the methods adopted to strengthen those defences. Then the bearing of cleanliness on health is discussed, together with the importance of ventilation, rest, and sleep. In the final chapter on food emphasis is laid on the importance of proteins as body-builders, which, as is well known, cannot be replaced by any other foodstuff. "If there is a shortage of one body-builder we must rely on another." Years ago Sir Robert Hutchison said that in order to have enough protein it was necessary to take too much. This paradox implies that in the breaking down of food proteins it is best for the body to have a wide choice in order to select the most appropriate building material. He regarded this as a means of increasing resistance against disease. Unfortunately it is just the proteins which are being most severely rationed. This may be inevitable, but scarcely justifies the self-commendation to which the Ministry of Food is rather prone. It is well that everyone should know the important facts so engagingly set forth in this book.

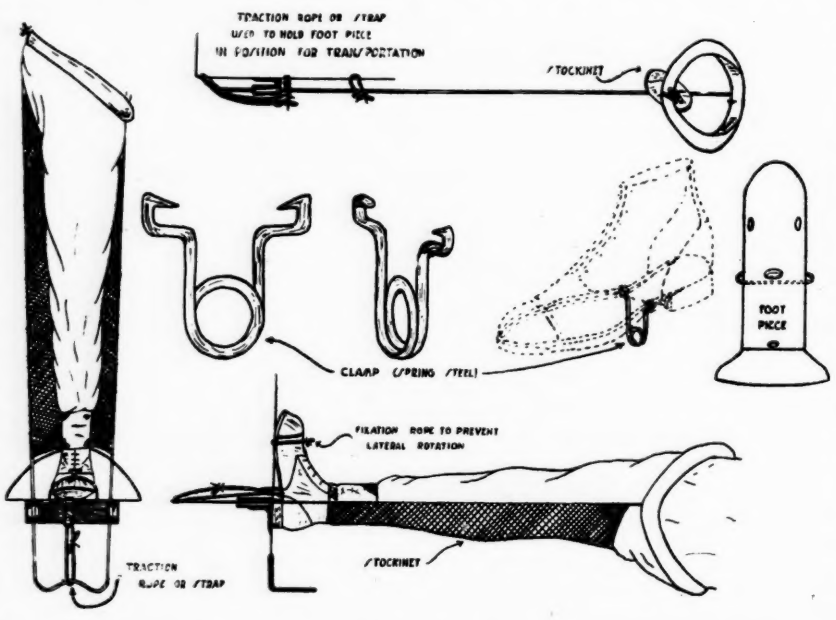
Medical officers of the South African Army Medical Corps now on active service, when writing home, have often expressed their wish for medical literature, especially such publications as may be applicable to field conditions in Africa. Some of them have access to the *Bulletin of War Medicine*, published in England by the Medical Research Council, but for those not so favourably placed the South African Red Cross Society has entrusted to a subcommittee the task of providing an abstract service especially designed for S.A.A.M.C. officers. Copies have reached this country of Nos. 1 and 2 of the *Digest of War Medicine*, published by the South African Red Cross Society, P.O. Box 8726, Johannesburg, Transvaal, South Africa.

Preparations and Appliances

EXTENSION FOOT-PIECE AND SUPPORT FOR USE WITH THE THOMAS LEG-SPLINT

Colonel E. A. MCCUSKER, *M.C.*, A.D.M.S. of a Canadian Division, writes:

For some time it has been evident to me that a simpler method of applying the Thomas splint must be devised in order to obtain the maximum benefit from its use, in addition to which the procedure is wasteful of time and material. The difficulties encountered in the ordinary method of application are numerous: (*a*) Many bandages are required to make a trough in which to support the fractured leg. (These need adjusting, which is difficult in the dark, and they require so much handling that cleanliness is impossible.) (*b*) The clove-hitch presents difficulties to the inexperienced. (*c*) The calliper is not satisfactory, nor is the skewer. (*d*) A short piece of wood or metal must be carried for a windlass to obtain traction. (*e*) The reversible stirrup (Sinclair) must be carried, it is not steady, and a bandage must be used to anchor the foot to it. (*f*) Suspension cannot be obtained until the patient is placed on the stretcher. The suspension bar is then put in position and bandages must be used to suspend and anchor the splint. (*g*) The patient cannot be removed from the stretcher without removing the suspension bar.



To simplify this technique it is suggested that a stockinet be slipped over the Thomas splint to form the supporting trough. This can be sterilized and carried in a waterproof case attached to the splint. It requires little handling and can be put on in the dark. It can be washed several times and decontaminated if exposed to gas. It is inexpensive. (If surgical stockinet is not available the leg of an old pair of under-pants serves admirably.)

The combined extension foot-piece, which can now be slipped on, takes the place of all other equipment in that: (1) The spring instep clamp is attached to the waist of the boot and passes through the oval hole in the centre of the foot-plate. The toe is fixed to prevent lateral rotation. (2) Extension is obtained and maintained by a rope or strap from the spring instep clamp to the notch in the end of the splint. (3) From the heel of the foot-piece a bar of light iron extends downwards two inches, then bends at right-angles towards the body to rest on the ground or on the stretcher and takes the place of the suspension bar. (4) The patient can be moved readily to and from the stretcher. (5) The toe-piece extends high enough to carry the weight of blankets. (6) The foot-piece is attached to a cross-bar by a hinge; this bar is turned at each end to fold around the parallel bars of the splint, on which it can slide to the desired position, but which prevents any lateral or rotary movement. When not in use the foot-piece folds through 90 degrees to lie parallel to the bars of the splint. It is tied in this position, and cannot be lost.

The advantages of the method are, first, its simplicity, economy, lightness, and mobility; secondly, that highly trained personnel are not required for rapid and satisfactory application.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY SEPTEMBER 27 1941

SHELTERS AND THE COMING WINTER

War has brought in its train two interrelated social revolutions. One is evacuation; the other, the crowding of urban populations into shelters. The first thing that comes home to a visitor to an air-raid shelter in London or any large town is the necessity for evacuation of every child up to school-leaving age and of elderly and infirm persons. If this were complete many shelter problems would no longer arise. The fact has to be faced, however, that the habitual shelter population does include a large proportion of children as well as other persons for whom life in even the best-conditioned shelter is detrimental.

Improvement has undoubtedly taken place during the past twelve months of trial and experiment. This is borne out by an investigation recently undertaken on behalf of this *Journal* of shelters in many London boroughs and in seven principal cities of Great Britain, some of the results of which are summarized in this and last week's issues. Some shelters now come up to a standard with which only the most fastidious could find fault, but many others fall far below that level. One important fact, nevertheless, is that in well-arranged dormitory shelters the conditions of health and amenity are better than many of the very poor, who are the most regular of the shelterers, experience in their own homes. The authorities in different areas, even in adjacent boroughs, have approached this new problem in very diverse ways. Some seem almost to resent the fact that it is their duty to provide this accommodation, and they carry out only the niggardly minimum required; others deal with the problem imaginatively and on bold lines. Some have appointed a special official to look after the shelters; others have attempted no kind of co-ordination between the four or five different departments concerned in construction, equipment, and maintenance, thus causing long delays in getting work done, with a result less satisfactory than it might have been. The Ministry of Health has recently issued a pamphlet entitled *Air-raid Shelters: Notes on Principal Provisions*; this contains some excellent advice which, if followed in the spirit as well as in the strict letter, would ensure good shelters all over the country and eliminate the anomalies that at present exist.

The service of the medical aid post shows striking variations in different places. Sometimes so great an emphasis is laid upon the emergency character of this provision that the posts are hardly used at all. But where those responsible are alive to the necessity and opportunity for preventive measures the posts are in constant requisition, much timely advice is given, and many patients are referred to their own doctor or to a hospital. In some shelter communities it has been possible to introduce diphtheria immunization on a large scale or to practise the systematic spraying of children's throats. How valuable an aid-post service may be is illustrated from the experience of a large shelter in a provincial town where, owing to its reconstruction from a disused canal, the floor was constantly damp and the walls reeking; yet there was very little illness last winter among the thousands of people it accommodated, thanks to the work and vigilance of the doctors and nurses attached to the post. The treatment of the child problem in the shelters is very unequal. In many places the children seem to be ignored. In others they are watched carefully in order that advantage may be taken of any apparent deviation from health to insist upon evacuation. One obvious omission is the complete lack of provision for nursing mothers to tend their infants in privacy. Only in the model medical aid post now being constructed at Newcastle, apparently, has any thought been given to this matter. Another point noted was the absence of inspection lamps or torches for the service of the medical aid posts, and of surgical material for dealing with cuts and lacerations.

The original timber-and-canvas bunks, which were easily damaged, becoming filthy from use and harbouring any parasite which might find its way into the shelter, are gradually being replaced by all-steel bunks, larger, of better construction, and more restful for the sleeper. There is now usually more space between bunks, and sometimes a plywood screen is placed at the bunk head to prevent droplet infection. Some shelters are bunked to capacity, with no room to move about. Most authorities discourage sleeping in shelters in the absence of an "alert." One city is proposing to remove every night ten thousand of its in-town population to special shelters on the periphery of the city.

The provision for cleansing is one of the most unsatisfactory features in many areas. Sometimes everything is left to the shelterers themselves or the responsibility is placed upon the shelter wardens; sometimes there are occasional visits from the cleansing departments. In a few instances shelters are provided with both water-closets and chemical closets, the latter remaining closed unless a breakdown in the water supply or drainage occurs. The provision of drinking-water is most primitive in some places. In one large city cans were found provided in most of the shelters; elsewhere, stone jars or a sealed container. But in the great majority of shelters a tap is taken from the main. Lighting is another difficulty. Some authorities have installed an alternative source should the main system be put out of action. One city has an emergency battery set in every shelter, but in another the only emergency lighting in most of the shelters is naked candles. Hurricane lamps or oil lamps are often provided, but in places there is no emergency lighting at all. Sometimes provision is made for dimming the lights at a certain hour to permit of the people getting better sleep, but elsewhere, notably in the London tube stations, the lights glare brilliantly all the night long. In one big city, after complaint had been made that the bright lights prevented sleep, the authorities substituted lights so feeble that it is impossible for people to read or usefully to occupy themselves in the evening. For heating the shelters the Ministry of Health recom-

mends Cura stoves, but if these are to function properly they must be put in by an expert. A most successful heating installation was seen at Liverpool in the shape of a concrete box or cover containing a heating element. Another good type of heater was a thermostatically controlled heating bar seen in several places. In no case was gas-heating seen, and the few oil stoves are gradually being replaced by electrical appliances. Some officials argued that so long as the shelter is dry the people will keep themselves warm, but in some basement shelters the draughts in cold weather must create an arctic-like atmosphere.

The actual construction of shelters is not primarily a medical problem, but from all aspects of health, physical and psychological, the narrow trench shelters and adapted tunnels and tube station platforms are not satisfactory, because in these passages there is not enough room for movement. The best kind of shelters are those which can be bayed off into approximately square compartments, with a section for medical aid post, canteen, and recreative facilities. The keystone of shelter life is the warden. If there is a good warden there is a good shelter. Women wardens, especially the motherly type not younger than 40, are in most instances more suitable than men. In its recent memorandum the Ministry of Health has recommended the employment of women wardens in the proportion of one to four or five men. It would be advantageous if the proportion in the large shelters—that is, those holding 500 and over—were at least one woman to two men and in smaller shelters one woman to one man. Two large provincial authorities prefer women wardens to men as they find they are more conscientious and have a better influence in the shelters.

No doubt shelters will be developed and improved still further. The shelter problem is by no means solved. Perhaps when the solution is reached and the perfect shelter makes its appearance the need for it will have passed away.

COLLAPSE THERAPY IN PULMONARY TUBERCULOSIS

The benefit that individual patients derive from collapse therapy is now generally admitted. The opposition by some workers to its wider application therefore needs examination. It is sometimes maintained that the proportion of cases suitable for this treatment is very small, because usually either the disease will heal with a sanatorium regime or rest in bed, or it is already too advanced. In this view the time factor is considered of little importance, and the fact that indications for collapse vary with the experience and skill of the treating team of physician and surgeon is ignored. Sometimes, also, published results are quoted to show the slight benefit gained by large groups of patients from individual collapse methods. We have already pointed out[1] [2] that the results can be truly assessed only when collapse therapy is regarded as a whole, for the decision to use it implies that "the least serious method applicable to the particular case will then be chosen, to be followed by others the choice of which will depend on the effect obtained by the first." Other workers appear to regard collapse therapy as a substitute for rest in bed, and not as an ancillary method which, if good results are to ensue, must be supported by complete rest until quiescence is established. Others, again, stress—perhaps overstress—the difficulties and potential complications, which, in fact, largely depend on proper choice of method and conduct of treatment. They tend to consider the more drastic methods of collapse to be almost reckless, and their caution is supported by the belief that "chronics," if left alone, carry on for years a comfortable though restricted life. But this expectation is not supported by vital statistics, and pays scant regard to the personal factor—that is, the various circumstances on which the patient's life will depend.

Up to the present collapse therapy on a scale that might be expected to influence fatality rates in whole communities has been practised in very few centres. It is not surprising, therefore, that Drolet in his statistical studies[3] [4] found that "surgical treatment," and incidentally "sanatorium treatment" too, has so far had little effect upon these rates. (A source of error may have been introduced by Drolet in his calculations, as suggested by Bogen[5] and recently emphasized by Potter.[6]) We have already drawn attention[2] [7] to results of widely applied collapse therapy, and this must be taken to mean its use at an early stage of treatment. Results recently given by Potter[6] deserve publicity. A follow-up study was made of two groups of patients: the first, treated in sanatorium between 1926 and 1932, consisted of 1,458 patients, of whom 6.2% received collapse therapy; the second, treated between 1932 and 1938, consisted of 1,619 patients, of whom 61.2% "were subjected to one or a combination of the procedures of pneumothorax, phrenic interruption, and thoracoplasty." The radiographs taken of all patients on their admission were reviewed, and the present criteria of the American National Tuberculosis Association were used in classifying the stage of the disease. In each case the course of the disease was followed by serial films and/or clinical observations. The groups were found to be comparable with one another in age and in extent of tuberculosis. "Far advanced disease" existed in 88% of each group.

From the period between 1932 and 1938 only 19 patients could not be traced. In this group there were 151 patients in whom disease was controlled by rest alone. For 276 the outlook was considered hopeless from the beginning, and the remaining 992 were considered suitable for collapse therapy. In 378 (38%) of these the collapse was effective: at the end of the six-year period 323 were working or ambulant, and 13 (3.4%) had died. In 553 pneumothorax was abandoned and other forms of collapse proved ineffective: 81 of these were working or ambulant (in 49 the cavity closed spontaneously), and 240 had died. In 61 the collapse was effective on one side but there was a cavity in the contralateral lung; 30 were working or ambulant and

[1] *British Medical Journal*, 1936, **2**, 1267.
[2] Ibid., 1938, **1**, 1212.
[3] *Amer. Rev. Tuberc.*, 1938, **37**, 125.
[4] Ibid., 1939, **39**, 597.
[5] Ibid., 587.
[6] Ibid., 1941, **43**, 184.
[7] *British Medical Journal*, 1938, **2**, 75.

4 had died. (Potter also gives figures to show the good remote, as well as immediate, results of effectively collapsed cases.) When the 1,458 patients treated in 1926-32 were classified according to the stage of tuberculosis and indications for collapse therapy (by the same standards as the more recent group, 109 being untraced), it was found that collapse therapy should have been attempted in 801. According to the follow-up findings in the 1932-8 group effective collapse might have been anticipated in 38%—that is, in 305 patients; only 3.4% of these (that is, 10 patients) should have been dead at the end of the six-year period in 1932. Actually 222 had died by then. Comparing the whole of each group of patients, Potter found that at the end of the six-year period 1926-32 1,026 of the 1,458 traced patients (that is, 76%) had died; 109 were untraced, and it may reasonably be expected that a large proportion of these died too. At the end of the six-year period 1932-8 only 708 (or 44% of the 1,619 patients) had died (19 patients being untraced).

These figures appear to be the most convincing yet brought forward to prove the value of collapse therapy. But we agree with Potter when he says: "We do not mean to imply . . . that the results in effective collapse therapy are entirely responsible for the difference in the total death rates in the two periods, for more energetic application of bed-rest, and the clinical improvement in the ineffectively collapsed cases which not infrequently followed, served to prolong life in the patients treated in later years."

INEFFICIENT STEAM STERILIZATION

Puerperal tetanus, of which a case was recorded in this *Journal* last month by MacLean and Challen,[1] is an exceedingly rare disease, and when it occurs its origin may be in doubt. Nevertheless the fact that Pulvertaft[2] was able to attribute a case of tetanus after hysterectomy to infection from an unsterilized vulval pad led, by way of a request from the Medical Officer of Health for the County of London, to the appointment by the Royal College of Obstetricians and Gynaecologists of a committee to investigate the possible transmission of anaerobic infections by surgical dressings, with special reference to vulval pads as a source of tetanus. This committee has now issued its report.[3] Two of its nine members were bacteriologists, Dr. G. W. Goodhart and Prof. J. McIntosh, and they undertook an investigation of the properties of cotton-wool which took them into factories as well as laboratories, the results of which make it perfectly clear why this material invariably contains spore-bearing bacteria. Brown cotton-wool undergoes no chemical treatment, and therefore contains bacteria from the soil in which it was grown. White cotton-wool is bleached by boiling in alkali and subsequent treatment with chlorine, and this process sterilizes it, but after washing in water—a treatment which at the factory investigated loaded it with cocci owing to the multiplication of these organisms in a softening plant—it is dried in a current of hot air. The blower fans in the premises examined were close to the floor in such a situation as to suck up dust from crude cotton-wool and even street dirt; cotton-wool is, of course, an excellent filter for particulate matter in air, and the large volume of air necessarily employed served therefore to recontaminate the material thoroughly. Sporogenous bacteria were in fact cultivated from all samples examined; these included *Cl. welchii* in several cases and proved *Cl. tetani* in one. To filter the air used for drying or to sterilize the material in bulk in the factory may or may not be practicable, but unless and until such a precaution is taken, cotton-wool requires efficient steam sterilization before use for surgical purposes. The committee then inquired into the efficiency of this process as carried out in various hospitals. Their general conclusion is that although the autoclaves were generally of satisfactory design certain features of their use were open to criticism. In some cases those responsible for packing material in drums were unaware that overtight packing can prevent adequate penetration by steam. Sterilization was not always carried out under rigidly controlled conditions of time and temperature; and sometimes, when such conditions were observed and the apparatus furnished automatically a graphic record of working, it was no one's business to inspect this and to reject any batch of dressings for which the record was unsatisfactory. Periodic tests were not always made, and when made consisted in some cases of observing colour changes in capsules, a method of test which is considered unreliable. The report therefore makes detailed recommendations about the manner of using autoclaves, the main points in which are loose packing of drums, evacuation to a negative pressure of 20 to 25 inches of mercury, the maintenance of a steam pressure of 20 pounds for 20 minutes, and a monthly bacteriological test with spore-bearing anaerobes. If steam sterilization is so often imperfect, it may well be asked why accidents consequent on it are so rare. The probable answer is that previous washing frees such articles as towels of most of their bacteria, and cotton-wool, though in a class apart owing to the regularity with which it is contaminated with resistant bacteria, is not ordinarily used in such a way that infection from it is likely to occur.

[1] *British Medical Journal*, August 30, 1941, p. 302.
[2] Ibid., 1937, **1**, 441.
[3] *J. Obstet. Gynaecol. Brit. Emp.*, 1941, **48**, 394.

HEALTH IN THE SOVIET UNION

The Society for Cultural Relations with the Soviet Union arranged in London a largely attended week-end school for teachers, when various aspects of Soviet life were demonstrated. One session was devoted to health and medical services. Dr. Joan McMichael, who travelled extensively in Russia shortly before the war, described the preventive aspect from which the Soviet Government approaches these problems. Free medical treatment is the right of every Soviet citizen according to Article 120 of the Constitution, and the surveillance of the Government extends from a little before the cradle (ante-natal services) to a little beyond the grave (the storage of healthy cadaver blood in the institute at Moscow). Dr. McMichael paid special attention to the school health services, where a great deal seems to be done by the children themselves. In the upper classes of Soviet schools the children elect their own health inspectors, one of whose duties is to keep a daily diary, noting all absences, with a view to the early discovery of infectious illness. The children also elect five or six of their health inspectors to attend the municipal schools health assembly. During an anti-malarial campaign throughout the Soviet Union the children were encouraged to work in their own laboratories on the problem of the malarial parasite, and at an all-Union conference on malaria in Moscow these children sent along their own representative, who contributed some original work on the subject which was highly acclaimed. Dr. McMichael praised the ingenuity of the Russians in

giving health subjects a popular appeal. The museums in Russia, including the health museum with its models and films of health and sanitation services, are crowded at every hour of the day. The nearest equivalent to the Soviet polyclinic is one of our large health centres with some introductions from the out-patient department of a voluntary hospital, but it is quite separate from the hospital, and, although there are beds for examination purposes, there are no in-patients. A dietetic restaurant is attached to all these polyclinics. Consulting-rooms and equipment are, of course, provided by the State, but the patient can see his or her own doctor and can be referred by him to a specialist in the building. If the patient's doctor has reason to believe that the working or housing conditions of the patient are deleterious to health he has the right to make personal investigations and to recommend changes to the management. Soviet hospitals, Dr. McMichael said, did not greatly differ from hospitals elsewhere, but one unusual feature was the monthly or fortnightly conferences of the whole hospital, including the staff from consultants to ward-maids, and the patients. The ambulance service in Moscow is so organized that if an accident occurs anywhere in the city the victim is brought to the central hospital within eight minutes, where a surgical team awaits him and blood transfusion is given if necessary. She spoke of many other features of Soviet life, such as the dairy kitchens and breast-milk stations attached to the maternity and child welfare centres, and the statement of protein, carbohydrate, and fat values given on the menus in the State restaurants.

COMPULSORY PASTEURIZATION IN ONTARIO

In 1938 the Province of Ontario, convinced that further progress in rendering the milk supply safe needed something more than voluntary effort, decided upon compulsory legislation. An amendment to the Public Health Act was therefore introduced making pasteurization compulsory in all cities and towns irrespective of the size of the population. Provision was also made for applying the Act by Order in Council to any other area recommended by the Minister of Health. The purpose of this clause was, of course, to bring in at a later date rural areas, pleasure resorts, and other places that were likely to present special difficulties at the start. One important feature of the Act is the requirement that all milk must be pasteurized in plants that have been approved by the Provincial Department of Health, and that a yearly certificate of approval must be obtained for each plant to show that it is still conforming to the official demands. Anyone familiar with the lack of uniformity of control in Great Britain, where pasteurizing plants are licensed by local authorities often having little or no knowledge of the important factors concerned, will appreciate the wisdom of this enactment. Though this legislation has been in operation for only two years, considerable progress has been made. According to Dr. A. E. Berry,[1] Director of the Division of Sanitary Engineering in the Ontario Department of Health, 27 cities and 147 towns came automatically under the Act. Seven different Orders in Council have since been passed designating villages, townships, and rural areas. All villages and police villages of 500 inhabitants or over have been brought under the Act, and many smaller communities are likewise included. It is estimated that over 98% of all milk now sold in Ontario for consumption in the fluid state is pasteurized. To do this 813 licensed plants are necessary —a figure probably more than double that for the rest of the Dominion. Difficulties have been encountered, as was to be expected, but on the whole progress has been remarkably rapid and opposition has not been serious. By exonerating local authorities from the necessity of deciding for or against pasteurization—a decision that had formerly to be taken by bodies largely untrained in public health methods—and by insisting on uniform requirements for all pasteurizing plants in the Province, it has removed two important obstacles to a progressive programme of milk control. The difficulty of providing sparsely populated rural areas with adequately pasteurized milk is proving by no means insuperable. Plants have been established at convenient centres from which milk can be delivered over relatively wide areas. It is as yet too early to say what the effect on the eradication of milk-borne diseases is likely to be, but it is interesting to note that the typhoid fever death rate in 1939 was halved, that cases of undulant fever were reduced by about 45%, and that a substantial diminution was apparent in the infantile mortality rate. Ontario is to be congratulated on being the first large area in the British Empire to introduce compulsory pasteurization. It is to be hoped that others will soon follow its example.

[1] *Canad. publ. Hlth. J.*, 1941, **32**, 208.

INTRAPERITONEAL SULPHANILAMIDE

It was only after four years of its systemic use that sulphanilamide began to be tried extensively as a local application. No one regarded it as an antiseptic in the ordinary sense until the work of Fildes and his collaborators explained the mechanism of its action: for the mystification which preceded this we have chiefly to thank those German and French authors who maintained that its action on bacteria was indirect and in some unspecified way required the co-operation of the body as a whole. For a year or more now sulphanilamide powder has been proving its worth as an application to infected wounds, whether as a prophylactic or for the treatment of chronic infections, particularly streptococcal. No doubt other uses of this kind will be found; dermatology appears to afford an extensive scope for trials of the method, and possibilities of successful local application of sulphathiazole in the upper air passages are envisaged by M. E. Delafield and Edith Straker[1] in a recent issue of this *Journal*. Now a further new use for sulphanilamide has been found by S. Rosenburg and N. M. Wall,[2] who advocate its local use in peritonitis—an interesting suggestion, because, although these authors do not refer to it, some of the earliest experimental work on sulphonamide compounds has a bearing on this method of treatment. The peritoneum was the battleground of a controversy between Levaditi on the one hand, who maintained that local introduction of the drug in streptococcal peritonitis in mice was ineffective, and argued hence that sulphanilamide had to undergo some change elsewhere in the body before it could act, and Colebrook on the other, who found that intraperitoneal injection of the drug was effective. We now know, of course, that there is no *a priori* reason why sulphanilamide should not act locally in peritonitis provided that the bacteria concerned are susceptible to it, that adequate distribution can be achieved, and that the drug persists *in situ* long enough to secure a useful effect. Rosenburg and Wall first tested the method in rats, giving them an intraperitoneal injection of cultures containing coliform bacilli and various nondescript cocci made from cases of suppurative appendicitis or peritonitis,

[1] *British Medical Journal*, 1941, **2**, 221.
[2] *Surg. Gynec. Obstet.*, 1941, **72**, 568.

and treating them by intraperitoneal injection of sulphanilamide suspended in saline. This treatment saved about half the animals if applied immediately, and some even if delayed; it appeared to be more effective than subcutaneous injection of the drug. It has since been tried in ten patients with peritonitis, mostly of appendicular origin, with encouraging results, quantities of from 1 to 4 grammes of sulphanilamide powder being "placed" in the peritoneal cavity at the end of the operation: this treatment was usually followed by systemic administration, the subcutaneous route being chosen. Although a few observations were made on blood sulphanilamide levels after this initial procedure, it is clearly desirable to know more about the rate of absorption from the inflamed peritoneum, and to discover if possible what degree of diffusion takes place in the peritoneal cavity itself: it is a little difficult to picture the dispersion of such comparatively small doses throughout the area affected in a widespread peritonitis. Further observations should also take account of the nature of the infection, including anaerobes; these were apparently eliminated from the inoculum in these authors' animal experiments by the method of cultivation employed, and they are disregarded in the clinical reports. It is by no means certain which of the very various bacteria escaping from a perforation in the lower part of the alimentary tract are chiefly responsible for the damage which ensues, and their susceptibility to sulphanilamide varies greatly, *Streptococcus faecalis*, for instance, being completely resistant to it. Such studies might even throw some light on the alleged complicity of *Cl. welchii* toxaemia in producing the graver manifestations of peritonitis.

PASSING OF ANTI-PNEUMOCOCCAL SERUM

We have discussed on several previous occasions the possible future of serum treatment in pneumonia. So far as we are aware, in this country it is dead or at least moribund, but its progress here has always lagged far behind that in the United States, and general adoption of the method would have been a slow process even in the absence of competition by chemotherapy. In America serum treatment and all the diagnostic facilities which it demands have in many centres been organized to perfection, and produced solid and striking results on a scale unapproached elsewhere. It is from there that the final judgment on the future place of serum in treatment must come. Since the first somewhat sceptical reception of sulphapyridine in America opinion has slowly veered towards increasing emphasis on the value of chemotherapy and less on that of serum. Alternation of the two treatments for the sake of comparison ceased some time ago, and nearly all patients receive chemotherapy. But the list of alleged indications for giving serum in addition or even, exceptionally, alone has remained considerable; these, as reviewed in our columns a year ago, were said to include hepatic and renal disease, disorders of the blood-forming organs, extensive consolidation, profuse bacteriaemia, advanced age, and pregnancy. Combined treatment also had the sanction of well-attested experimental support; mice, in this as in other infections, respond better to serum plus drug than to either alone. Although this position might well have been sustained indefinitely, a further stage in the displacement of serum treatment to a minor role seems to have been reached in the studies of N. Plummer and his colleagues[1] at the Bellevue Hospital, New York. In all their 607 cases chemotherapy was begun as soon as specimens of blood and sputum had been obtained; the type of pneumococcus was determined, and as soon as this information was available alternate cases of each type were also given concentrated rabbit anti-pneumococcal serum. The two series are therefore as strictly comparable as the design of this study could make them, and an analysis of their clinical features also shows uniformity between them. When a case due for serum treatment had already responded to chemotherapy when a type diagnosis was forthcoming serum was not given, but the case remains for the purpose of assessment in the drug-plus-serum group, a policy which tends perhaps to flatter this treatment; to remove the case from this group would of course unduly weight the scales in favour of chemotherapy alone. Among 306 patients treated by chemotherapy alone there were 34 deaths, a mortality of 11.1%; of 301 patients receiving drug and serum 44 died, or 14.6%. The exclusion of deaths within twenty-four hours of starting treatment reduces these mortality rates to 9.3 and 9.8% respectively. The trivial difference between these figures persists throughout a closer analysis; there is no greater difference whether the cases were treated early or late, whether they were in the higher or lower age groups, and whether or not they had bacteriaemia—a feature the incidence of which in this series was 20.6%. Composite temperature records of the Type I and Type II cases show an almost identical rate of fall in both forms of treatment. There is no important difference in the frequency of various complications; 10 patients diagnosed as having pneumococcal endocarditis and 7 complicated by pneumococcal meningitis all died whether serum had been given or not. The drugs used were sulphapyridine in three forms, sulphathiazole, sulphamethylthiazole, and sulphadiazine, and there is little to choose between them, but the three last named were used in too few of the cases for any exact conclusions to be drawn about their relative merits. It should be added in explanation of the fairly high gross mortality that all cases of pneumococcal pneumonia were included, regardless of their distribution or origin; in a large proportion of the fatal cases pneumonia was a complication of some other serious disease.

The authors' final conclusion is inevitably that serum need be given only to those patients who cannot tolerate sulphonamide treatment, or who do not respond adequately to it within twenty-four or forty-eight hours. This second indication is open to argument, and the first, strictly interpreted as meaning patients who have previously had severe toxic reactions, is a rarity. It has to be remembered that the production of concentrated serum for treating the many different types of pneumococcal infection is a laborious and costly process, and increasing restriction of indications for its use may reduce demand to an uneconomic supply level. Will anti-pneumococcal serum, though a far more potent therapeutic agent, go the same way as anti-meningococcal?

[1] *J. Amer. med. Ass.*, 1941, **116**, 2366.

The Czechoslovak Executive Committee of the recent meeting of Czechoslovak-Polish doctors has sent the following message to the British Medical Association: "The members present at the meeting of Czechoslovak-Polish doctors, held in Edinburgh on September 11 and 12, unanimously decided to send their best greetings to their colleagues in the British Commonwealth of Nations. The present period, in which the fate of humanity is being decided, emphasizes the exceptional importance of the close co-operation of all democratic medical science, as well as the early reparation of the severe deterioration in health caused by the war let loose against democratic forces, and also for closer medical co-operation in all its spheres after the war. The Czechoslovak and Polish doctors are looking forward with all their hearts to this collaboration with the British medical world."

A PROCEDURE FOR THE TREATMENT OF GAS CASUALTIES

BY

L. A. STOCKEN, B.Sc., A.I.C.

AND

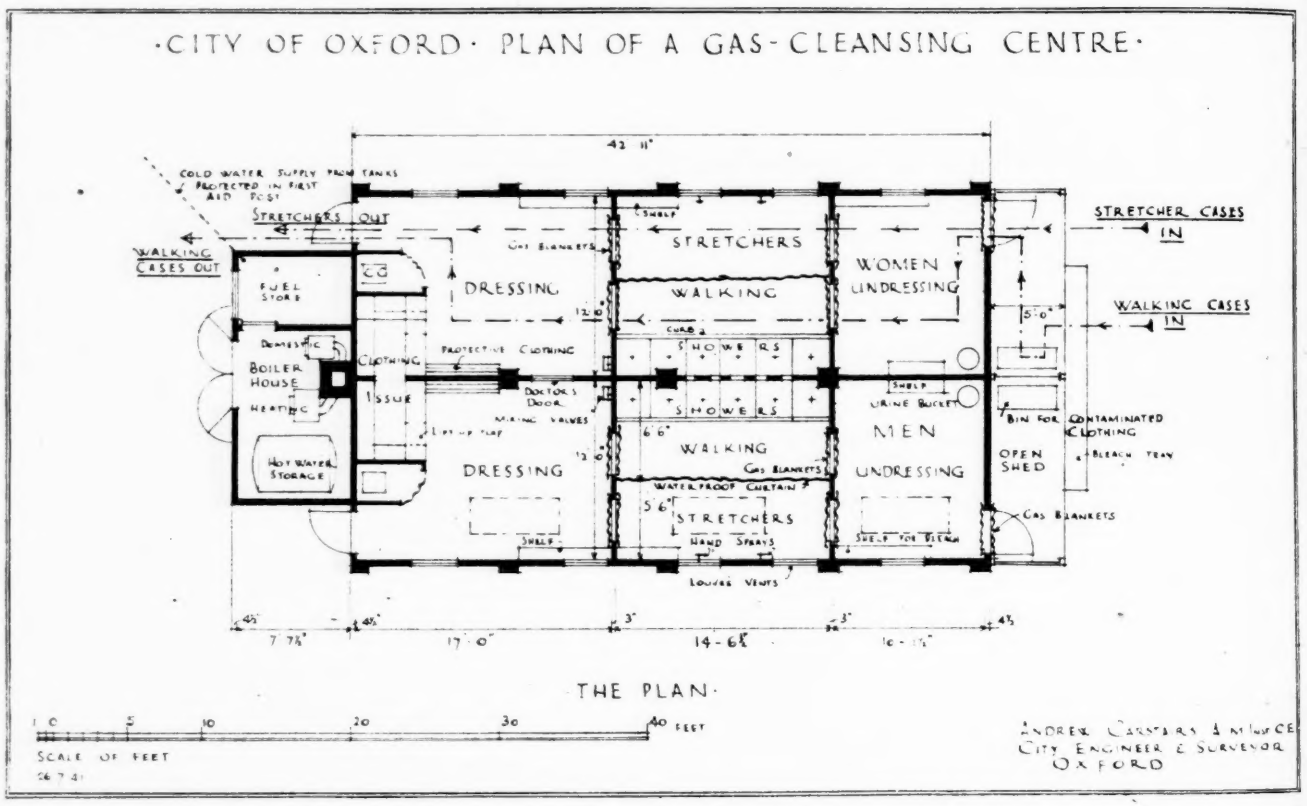
R. H. S. THOMPSON, M.A., B.Sc., B.M., B.Ch.

(Department of Biochemistry, Oxford)

The cleansing of gas casualties presents two major problems: first, the treatment of the gas burns on the body surface; secondly, the marking, cleansing, and returning to the rightful owners of all gas-contaminated clothing. From the nature of the physical and pathological processes underlying vesication by blister gases it is at once obvious that excessive elaboration of the second of these two problems will lessen the effectiveness of the treatment applied to the actual burns by reason of the delay necessarily involved. To obtain the most satisfactory results speed is essential, and we must aim at securing a system of marking clothes for subsequent identification which will not unduly delay the starting of treatment. The problem is further complicated by the fact that only a limited amount of protective clothing is available for any one cleansing centre, so that the number of workers is thereby limited.

In view of the special difficulties attendant on the decontamination of gas casualties and the general organization of cleansing centres we feel that it may be of some value to describe a procedure, based on the official recommendations, which has been worked out and tested at a cleansing centre in Oxford. If this description serves only to call forth criticism of the procedure adopted it may direct the attention of the authorities concerned to some practical but none the less important problems.

In conformity with the official regulations the building that has been erected to house the cleansing centre is divided into male and female sides, each side consisting of a stripping-shed, an undressing-room, a shower-room, and a dressing-room, with a common equipment store. The city engineer has kindly permitted us to publish a copy of the plans, from which the general lay-out of the various rooms may be seen; this may be compared with the plan recommended in the Ministry of Health Circular No. 2241 (December, 1940).



Following on the principle of stationing a responsible person in the stripping-shed to be in charge of admissions, we have decided that it is of greatest advantage for the medical officer to limit, if possible, his activities to the shower-room and dressing-room. By so doing he can work without the hindrance of protective clothing, can direct the treatment of any serious eye lesions, and can supervise general first-aid measures in the dressing-room. Of the two workers in each dressing-room one shall be responsible for all clerical work (patient's name, address, nature of injury, etc.): the other will supervise the dressing of casualties and will carry out first aid where required. In addition, one or two workers, depending on circumstances, will be required to take charge of the equipment store and to issue towels and clothing.

Personnel

Efficiency and smooth running cannot be obtained if the centre is understaffed. In our opinion the minimum number of workers in each room on each side is two. In addition to the two workers in each stripping-shed the superintendent, if male, should be in charge of the outside workers on each side, and should be responsible for the orderly admission of casualties to the centre. If the superintendent is a female then a third responsible male worker must take charge of the sheds. In the shower-room one worker shall be responsible for douching the eyes of all casualties, while the other is in charge of the showers. It would add greatly to the efficiency of the centre to have a third worker in this room to assist with the eye-douching.

Equipment

In order to carry out the procedure of cleansing suggested here the following is the absolute minimum of equipment necessary for efficient treatment of casualties and for safety to personnel:

9 protective suits
13 pairs wellington boots
5 pairs protective gloves
5 helmets
5 hoods
12 pairs rubber gloves
5 rubber aprons
6 douche-cans with tubing and nozzles
2 bleach trays
12 buckets
6 bins
2 boot-brushes
4 pairs tailor's shears
4 pairs scissors
6 hand-basins
1 drum dry bleach
4 containers for bleach (tins or boxes)
10 hurricane lamps
5 electric torches
4 stools
Anti-gas ointment No. 2
Sodium bicarbonate
Soap
Wooden spatulas
First-aid equipment
Towels
Sets of clothing
Civilian respirators

Each member of the centre is expected to have been issued with a C.D. respirator. It will be noted that the suggested equipment exceeds the official issue in several respects.

In training the personnel of a cleansing centre it is helpful to divide their functions into: (*a*) duties of personnel on arrival at cleansing centre—these duties involving the setting-up of the centre in such a way that treatment may start immediately the casualties begin to arrive; (*b*) duties of personnel during cleansing procedure. It will be profitable here to consider these two aspects of the work separately.

Duties of Staff on Arrival at Centre

The first member of the staff to arrive must open the centre and lower all air-lock blankets. Such members of the centre as have been trained for work in protective clothing should begin to dress immediately on arrival. The first two of these workers to arrive on each side (that is, male and female) will be expected to put on full protective clothing (suits, wellingtons, protective gloves, gas-masks, helmets, and hoods) and to work in the stripping-shed. The next two to arrive on each side will prepare to work in the undressing-rooms, and will therefore put on suits, wellingtons, gas-masks, and rubber gloves. We are well aware of the fact that thin housemaid's rubber gloves do not provide a high degree of protection against mustard gas or lewisite; on the other hand, it is essential that the undressing-room personnel shall be able to work rapidly and, if the need arises, remove difficult articles of clothing unhampered by full protective gloves. We suggest, therefore, that workers in these rooms shall wear medium-thickness rubber gloves and shall take further precautions to decontaminate the surface of these gloves as described later.

Members trained only for work in shower-rooms and dressing-rooms will be expected to carry out their duties immediately on arrival. *Shower-room attendants,* having put on wellingtons and rubber aprons, must adjust the water-mixing valves and test the temperature of the water issuing from the showers. They must then fill the douche-cans with 1 to 2% sodium bicarbonate solution and hang them on hooks ready for use (nozzles should be opened till rubber tubing is filled; this will also ensure that neither tubing nor nozzles are blocked). They must then thoroughly wet all air-lock blankets. *Dressing-room attendants* must first collect and arrange the equipment in the stripping-sheds and undressing-rooms. On completion of this they will assist the dressing of any workers who have not yet finished putting on protective clothing.

When the above duties have been carried out all workers will go immediately to their posts, where they will check over the equipment and await the arrival of casualties.

Cleansing Procedure

The sequence of cleansing takes place in four stages—stripping-shed, undressing-room, shower-room, and dressing-room. The particular function of each stage in the scheme, which not only allows cleansing of the patient but also provides that he shall regain his washed clothing, is as follows:

STRIPPING-SHED

The two workers wear protective clothing, wellingtons, protective gloves, gas-masks, helmets, and hoods. (The personnel and equipment recommended in this and the following sections apply to one side only—that is, male or female.) Equipment consists of:

1 container of dry bleach (to replenish bleach solution)
Tray with bleach solution and brush (*Note 1*)
1 bucket of bleach solution
1 bucket of water
2 pairs tailor's shears
1 jar anti-gas ointment No. 2
2 wooden spatulas
Hurricane lamps and electric torches
Pile of "bag units" (*Note 2*)

Note 1.—The tray should be filled to a depth of about 1 in. with a thick suspension of bleach in water.

Note 2.—The "bag unit" consists of: (1) *Bag A*—A large numbered sack (21 in. wide, 30 in. deep); (2) *Bag B*—A slightly smaller numbered sack to which is loosely fastened a numbered tally attached to string loop for passing over patient's head. Each of the two bags and the patient's tally are identically numbered. The bags are folded up and fastened together with a single loop of cotton or a paper band so as to be readily separable.

Procedure.—On the arrival of a casualty the worker picks up a bag unit, detaches Bag A and hangs Bag B on a hook placed in the wall about 3½ feet from the ground. The patient is instructed to stand in the tray of bleach solution, to remove the contents of the pockets of his outer clothing, and to place them in Bag B. The worker meanwhile brushes the boots with the bleach solution. All coats, skirts, and hats are now removed from casualties and placed in Bag A; any other clothing obviously contaminated with liquid gas is also to be removed and placed in Bag A. After brushing with bleach solution the boots are removed, laces being cut to speed up the process if necessary. The boots are then dipped in a bucket of water to remove excess bleach, which would otherwise damage clothing, and are then put into Bag A. Bag A is now placed in a bin to await removal to a laundry. If it is desired that each article of clothing sent to the laundry should be numbered, the contents of Bag A can quite simply be numbered individually, using safety-pins, on arrival at the laundry, or at the cleansing centre *after* all casualties have been treated and sent away. If splashes of gas are observed on exposed skin or hair they are treated with anti-gas ointment No. 2, applied with a wooden spatula (wooden tongue-depressors serve excellently); if obvious erythema of the skin has already developed no ointment is applied. The patient now takes Bag B and passes into the undressing-room.

It is important that the floor of the shed shall be swilled down with bleach solution, from the bucket provided, at the starting of work and at intervals thereafter.

UNDRESSING-ROOM

The two workers wear protective clothing over underclothes (or protective aprons over boiler-suits), gas-masks, wellingtons, and medium-thickness rubber gloves. The equipment is:

1 container of dry bleach
1 bucket of bleach solution
1 bowl of bleach solution and 1 of water
2 pairs scissors
Anti-gas ointment No. 2 and spatulas
Several changes of rubber gloves
Latrine buckets
3 bins

Procedure.—Each patient is instructed to undress completely as rapidly as possible and to place his clothing in Bag B, which he has brought in with him; for speed it is desirable that the bags should be hung on hooks to facilitate the insertion of clothes. If either of the workers detects any heavily contaminated clothing that has escaped removal outside, this is to be removed from the patient and placed in a bin labelled "Clothes"; this clothing will ultimately be destroyed or, if national policy dictates that no clothes are to be destroyed, numbered pins may be attached to Bag B, one of which would now be fastened to the clothing before placing in the bin. The clothing can then be decontaminated and returned to the owner. Patients are also instructed to remove their gas-masks last, unless they are liquid-contaminated; gas-masks are then placed in a bin labelled "Respirators" for subsequent recovery. Any liquid splashes on the skin or on the hair are to be treated with anti-gas ointment No. 2 if this has not already been done. When the patient is completely undressed the numbered tally is detached from the bag and hung round the neck, and he is then passed through to the shower-room carrying his bag. In view of the limited protection afforded by the rubber gloves worn in

this room workers must be instructed to dip their gloved hand in the bowl of bleach solution provided, followed by rinsing in water, as often as possible—e.g., at five-minute intervals; further, if the gloves become liquid-contaminated they must be changed at once for a fresh pair, after washing the hands in bleach, and the contaminated gloves placed in a bin; they can later be decontaminated by boiling for two hours.

The floor of the undressing-room must be swilled down with bleach solution at the beginning of work and at intervals thereafter.

SHOWER-ROOM

The two workers wear rubber aprons over boiler-suits and wellingtons. The equipment consists of:

Soap
3 douche-cans for eyes, containing 1 to 2% sodium bicarbonate solution
2 stools

Procedure.—On entering the room each patient, after being instructed to sit on the stool provided, is to have both eyes well irrigated. He is then instructed to step under a shower, having previously put his bag in some convenient place. When thoroughly wet he steps out from the shower and soaps his entire body; on completion of this he gets under the shower for a final rinse. Particular attention must be paid to wetting and soaping the hair. The patient finally picks up his bag and passes through to the dressing-room. If for any reason patients are unable to wash themselves this will be done by the workers, who will in any case supervise all washing.

DRESSING-ROOM

Each patient is now handed one towel and one set of clothing. Before leaving, his name and address, particulars of any injury, and number on bag are taken down. The neck-tally is given up, and he is issued with a form giving instructions as to the method of decontamination of the contents of Bag B. Ideally the contents of Bag B should be uncontaminated; in practice, however, it is very possible that this will not be the case, and we feel that in the interests of safety the bag and its contents should always be decontaminated. It is suggested that the form be worded as follows:

WARNING

The contents of this bag are dangerous. They must not be taken into the house, and cannot be used with safety until they have been decontaminated as follows:

First empty all pockets and spread the contents, together with any other loose valuables, on the ground in such a way that they are not likely to be blown away or spoiled by rain. Leave for not less than forty-eight hours. Keys and other metal objects may be taken into the house directly and decontaminated by boiling for one hour in plain water.

All clothes and the empty bag should be hung out of doors and left for not less than forty-eight hours: all articles that will stand it should then be boiled for two hours in plain water.

Immediately after handling these articles the hands must be well washed with soap and water.

The empty bag is subsequently to be presented at the distribution centre in exchange for the decontaminated outer clothing.

When the attendant in the dressing-room is satisfied that all these steps have been carried out, the patient is provided with a fresh gas-mask and is allowed to leave the building.

Discussion

In order to prevent vesication after contact of the skin with mustard gas or lewisite it is well known that treatment with soap and water must be begun within ten minutes, and that this interval should be reduced as much as possible if the best results are to be obtained. If contamination of the eyes has occurred early treatment is even more essential. The decontamination procedure outlined above is an attempt to define and standardize the duties of the various workers at a cleansing centre in such a way that washing with soap and water may be started at the earliest possible time coincident with (*a*) a system of marking the clothing for subsequent identification and (*b*) the safety of the personnel of the centre. In the interest of speed, therefore, we have attempted to eliminate so far as is possible the responsibility of any member of the personnel to decide whether contamination of a particular article of clothing or of any part of the body has or has not occurred. It is for this reason that we have adopted the policy of removing all outer clothing in the stripping-sted and of irrigating the eyes of every casualty. At the same time, if, in the course of his duties, a worker happens to detect gross contamination of the skin or hair we have suggested that anti-gas ointment should be applied in case of any subsequent delay in getting under the showers. Anti-gas ointment will also obviously be of use in the accidental contamination of any of the workers. Further, it is in order to accelerate the process of undressing that we have adopted the use of rubber gloves in place of the official protective gloves for the workers in the undressing-rooms.

In view of the difficulty experienced by workers in giving verbal instructions to casualties while wearing respirators we suggest that notices printed in bold type should be exhibited in the stripping-sheds and undressing-rooms, giving concise instructions concerning the more important points of procedure. The notices that we are using are worded as follows:

For the stripping-shed:

READ THIS

1. Do not remove gas-mask.
2. Step into bleach tray.
3. Place contents of pockets in small bag.
4. Remove outer clothing and place in large bag.
5. Remove boots and give to assistant

Act Quickly and Obey Orders.

For the undressing-room:

READ THIS

1. Do not remove gas-mask.
2. Undress quickly and place clothes in bag.
3. When undressed go to assistant.

In the event of a large number of casualties arriving for treatment it would be helpful to exhibit a notice in the dressing-room giving instructions that no one must leave the centre before being issued with a new gas-mask; it will be remembered that these are not issued until the workers are satisfied that all other formalities have been carried out.

One of the greatest difficulties that we have experienced in training several teams of workers is the irrigation of the eyes: if blepharospasm is present it will be almost essential for the medical officer to take charge of the douching. In order to be in any way effective irrigation must be copious, and we are of the opinion, therefore, that three douche-cans should be an absolute minimum in any shower-room; on this basis two cans can be in use at any time, with a third in reserve to be used while the others are being refilled. It should be pointed out that if the employment of sodium bicarbonate solution involves any delay in filling or refilling the douche-cans warm water should be substituted; if douche-cans are unavailable or if any difficulty is experienced in their use by members of the personnel a large teapot will serve excellently and will have the added advantage of greater capacity. It will be noticed that in this procedure irrigation of the eyes is carried out in the shower-room. In spite of the fact that irrigation

should be begun at the earliest possible moment after contamination we are of the opinion that this should not be done by workers in the undressing-room; these workers will be wearing respirators and rubber gloves, and we feel that under these conditions it would be almost impossible to irrigate contaminated eyes effectively, and that an attempt to do so would only cause delay and possibly spread contamination. It might be argued that it is neither necessary nor even advisable to wash the eyes of every patient, and that it would perhaps be an advantage to restrict irrigation to those with obvious contamination of the eyes or who give a history of suspected contamination. All casualties, however, should be instructed to seek medical advice if ocular symptoms develop in the course of the next twenty-four hours.

The treatment of liquid-contaminated hair presents a difficult problem. Undoubtedly the most satisfactory method would be to cut off the affected hair; such a practice, however, particularly in the case of women casualties, might be strenuously opposed, so that a considerable delay might occur while persuading the casualty to allow the hair to be cut. It is for this reason that we have proposed the application of anti-gas ointment to the contaminated patch, while at the same time issuing instructions to the personnel to cut off the hair if this can be done quickly and with the consent of the patient.

We have not attempted to discuss here the difficult question of the cleansing of those who are also wounded. With a personnel trained in first aid most minor cases could almost certainly be taken by following this procedure. Stretcher cases obviously present special problems, though in a sense the treatment is simplified, since in these cases the marking of all clothing for subsequent identification is of very secondary importance.

Conclusion

We would like to point out that we are presenting an account of the above procedure solely because of the lack of detailed guidance that has been offered with respect to the many difficult problems arising during the working of a public cleansing centre. The only claim that we make regarding the procedure is that it has been tested at many practice exercises, and the cleansing of unwounded patients has been carried out with, we feel, the minimum of delay.

We would like to thank Dr. G. C. Williams, the medical officer of health, and the staff of the public health department of the City of Oxford for the help they have unfailingly given us in the organization of this cleansing centre; and also the personnel of the centre for their ready attendance at many practice exercises. Our thanks are also due to Dr. R. B. Fisher for many helpful suggestions.

GALLANTRY IN CIVIL DEFENCE

In a *Supplement* to the *London Gazette* dated September 12 the award of the M.B.E. (Civil Division) to Dr. JOHN JOSEPH MCCARTHY, medical officer, mobile unit, Islington, is announced. The announcement reads as follows: "Bombs demolished houses, gas and water mains were fractured, and people were trapped in the wreckage. Dr. McCarthy worked with the rescue party and repeatedly entered a gas-laden tunnel to attend to casualties and administer oxygen to a trapped man."

The name of Dr. GRACE ELIZABETH MCCONKEY, medical officer in charge, first-aid post, Liverpool, has been brought to notice for brave conduct in civil defence.

The names of Dr. GEOFFREY GORHAM HOLMES, medical officer, mobile first-aid unit, Bishop's Stortford, and Dr. GAVIN HAMILTON LIVINGSTONE, surgeon, Oxford, have been brought to notice for brave conduct when aircraft crashed and caught fire.

STATE OF PUBLIC SHELTERS IN LARGE CITIES

SUMMARY OF RESULTS OF SPECIAL INVESTIGATION

The shelter situation in London, in particular the improvements which have been effected since last winter, was the subject of an article in the last issue (p. 414). Below are summarized the results of an investigation on behalf of the *British Medical Journal* which has extended to seven principal cities of Great Britain. Once again we have to acknowledge the very great courtesy and help afforded by the officials of the various authorities concerned and by representatives of voluntary agencies. All the information set down has been obtained at first hand by personal visits to different types of shelters in the various towns.

In the large cities of Great Britain the shelter problem is much the same as in London, except that when raiding occurs it is likely to be more concentrated and therefore more devastating in its immediate effects upon the community and the public services, so that a larger proportion of the population seek shelter. In Liverpool, for example, it is estimated that 75% go to shelter every night, and 95% if there is an "alert." Another feature of badly raided cities which does not present itself in London is the nightly trek out of the city into the country. Outlying parish halls and such places have been sometimes opened up for these refugees, but many sleep in buses, others go to barns and other farm buildings, and not a few sleep in hedges and fields, with deleterious results to health.

The Position in Bristol

Bristol has 1,150 shelters, including communal and surface, but not Andersons. The city is divided into five sections for A.R.P. purposes, each division with its own organization, which is co-ordinated by central control. There are eleven medical aid posts, with nurses in attendance and doctors at call. Doctors must, however, be summoned by a responsible official, but in addition they visit shelters for routine health inspection. There are first-aid points in every dormitory shelter, which can be opened by nurse or doctor. One or two dormitory shelters have their own canteen, but the authorities discourage the making of shelters into "clubs." Dormitory shelters are sprayed and cleaned out every day. Very little infestation has been noted. The number of children who go regularly to the shelters—about 1,200 even in the middle of summer—gives rise to some disquiet.

One of the Bristol shelters is a tunnel, in which thousands of people congregated under very bad conditions at the beginning of last winter. The tunnel has now been lined with corrugated iron and turned into quite a good shelter, with a first-class medical aid post, built by the shelter marshal, a former Navy man. Nurses with V.A.D. training visit during the day the homes of the frequenters of small shelters. Bristol insists on bedding being removed from shelters every day.

Some very good concrete surface shelters were found in Bristol, but they were unused, although superior to some basements for which the public showed a preference. Some of the basement shelters seemed cold and gloomy. One, however, under a factory was well aired and warm. Cura stoves are being fitted in the trench shelters.

Shelters at Cardiff

There are groups of ten to twenty shelters, each shelter being something over 30 ft. long, with roofs, walls, and floors of solid monolithic construction, and with a layer of concrete skin on the foundations, the value of which is stated to be that should a bomb fall in the vicinity, while the building might "bounce," it would immediately return to its original position. Each of the two hundred or so buildings is to contain 48 bunks in two tiers, with reasonable space between each, and a plywood screen at the bunk head to prevent droplet infection. The sanitary

annexes are in reinforced brick. Both water-closets and chemical closets are provided for each building, but the chemical closets remain closed unless there is interference with drainage and water supply. The buildings, all of the same pattern, are well ventilated by extractor fans, the bar type of electrical heater is fixed to the walls, and water is on tap. Each group has a medical aid post. At shelters situated from two to five miles from the people's homes it is not possible to insist on the removal of the bedding each day, but airing lines are provided on the adjacent land. At each group there is a paid shelter warden, assisted by a number of voluntary workers, and a superintendent is in charge of the whole service. A debatable matter is the use to which such ambitious building can be put when the war is over. No doubt it can be used for temporary accommodation while the city's rehousing scheme is in progress.

Of the shelters in Cardiff itself the most interesting is the grim but apparently impregnable shelter in the castle wall. The Middle Ages seem back again with the St. John orderlies and nurses on duty all night in the castle gatehouse. Deep basement shelters cannot be provided in Cardiff owing to the nature of the soil and the nearness to sea level, which might result in flooding. No disease is reported from the shelters, and, generally speaking, the health of the city is no worse than in normal years, though there is a certain amount of scabies. Here as in Bristol the curious preference of the public for overcrowded basements under buildings, although good-type concrete shelters were available, to some extent thwarted the authorities.

Dispersal Policy in Birmingham

The shelters in Birmingham consist of large and small basements, trench shelters in biggish groups, a few surface shelters in which no one sleeps, and domestic communal shelters. During the winter the big basement shelters were overcrowded. The general policy of the authorities here is to discourage the aggregation of people in large shelters, but owing to shortage of materials a check has been put upon the number of communal shelters which the city can provide. Birmingham had a partially completed programme of domestic and domestic communal shelters when the Ministry of Health stepped in, and the programme when it is carried through will not be anything like the one originally planned. One of the largest shelters has been closed because it was found impossible to improve its condition. There is only one shelter in Birmingham with more than 500 bunks. Medical aid posts have been installed in some shelters, but in one or two instances have been closed down owing to lack of use.

Chemical closets generally have been installed in the Birmingham shelters. It was stated that the need for water-closets had not been experienced, and that these had the disadvantage of readily becoming fouled and of not being properly cleaned. A point was made of adequate lighting in lavatories as a means of preventing misuse. For artificial heating Cura stoves have been tried but have not proved successful, and preference is given to insulated wire heaters. Fans have been put in basement shelters where ventilation is unsatisfactory. The Birmingham shelters have not been bunked to capacity, which leaves more room for people to move about. A good feature of the steel bunks is the arrangement to ensure a hygienic distance between each sleeper. A criticism which must be made relates to the lighting. In the early days the shelters were lighted fairly adequately, but the people desired the lights to be lowered during sleeping hours, and 15-watt lamps were put in, resulting in far too dim an illumination. In many of the shelters also the only alternative lighting system, should the mains be put out of action, is by candles.

A large amount of the minor medical work in the shelters is carried out by the lay members of the Friends Ambulance Unit, but when it seems necessary they get people to go to their own doctor or the hospital, probably sooner than they would go otherwise. Scabies was reported to be very heavy during spring and summer, just how heavy is not known; but reports from various quarters, including school medical officers and factory surgeons, confirm it. It is attributed to the habit of people of sleeping in their clothes in the home as well as at the shelter. An increase in head-lice infestation has been reported, with odd cases in the shelters.

Manchester's Achievement

One of the most interesting shelters in the country is to be found at Manchester. It has been paved, the walls and ceiling lime-washed, the spaces bayed and bunked, with drinking-fountains, washhand basins, and water-closets to each bay. It has a medical aid post and a canteen. The people who use this shelter are for the most part very poor. The doctor in charge said that at first he and the nurses met with a good deal of hostility, but gradually people became more friendly, and their standards of hygiene are also improving.

Manchester has 380 deep basement shelters, affording accommodation for 75,000 people, and there are innumerable trench and surface shelters as well as a number of private ones. One shelter has been cream-washed, concealed lighting has been put in to very good effect, it has been air-conditioned, and is warmed with Cura stoves in the winter months. Bunks are wooden, with canvas mattresses. There is a medical aid post and a very attractive canteen.

The incidence of infectious diseases in Manchester is said to be lower than ever before. Some 20,000 children have had diphtheria immunization since last February. There has been an increase in scabies, but this began before the shelters were bunked; it has not been traced to shelter life, and is an expected accompaniment of war conditions.

Special Problems in Liverpool

The policy in Liverpool is one of general dispersal, but it is recognized that this is impracticable until the small shelters are made fit for habitation. The authorities here, as elsewhere, have to reckon with the desire of the people for company and for the "feeling" of security which belongs to a basement or a large shelter. Liverpool has also a serious problem, which does not seem to have arisen to the same extent elsewhere, in the extraordinary amount of damage done by children to its brick and concrete shelters. A whole range has had to be pulled down owing to this damage, and photographs make it difficult to believe that the damage has not been done by bombs. It is another illustration of how evacuation and shelter problems interlock.

The shelters are regularly inspected and dirty or lousy bedding is removed. The biggest trouble is reported to have been from fleas, the consequence of demolition work during dry weather. But health conditions generally have been good. One of the largest shelters in Liverpool is in two portions, one fitted with ticketed bunks and the other with unticketed seats on which people can recline. There are heater fans thermostatically controlled, which can also be switched on and off by wardens. The washing places have hot and cold water, and hot-water boilers have been installed. There is an excellent medical aid post, where it was noted that the sink was fitted with surgeon's taps.

The domestic communal shelters are being improved, bunked, adequately lighted, and are having a special type of concrete box heater put in. The shelters are kept locked and the key left with a responsible householder. Some concrete trench shelters are very small but have a high factor of safety. In these narrow shelters the people could never be allowed to forget that an air raid was proceeding, as they might do in larger shelters where there was plenty of movement. A large basement shelter, which was being reconditioned and will be attractive when complete, was also visited. Liverpool is fortunate in its officials, who are doing all they can to bring their shelters to a high degree of excellence.

The Glasgow Shelters

Glasgow suffers to some extent from lack of unified control. The general policy here again is dispersal. Over 15,000 shelters (including Andersons) for single families or other small groups have been put up, and there is actually shelter accommodation of one sort or another for one million persons, nearly equal to the entire population of the city. One type of shelter is peculiar to Glasgow—namely, the strutted close (or entrance to tenement), which has been found to stand even if the rest of the building collapses. Unless raids become much more frequent the Glasgow people will not be encouraged by their authorities to sleep in shelters. Definite cases of tuberculosis

(which is on the increase in Glasgow) have arisen from shelter life, and bronchitis and pneumonia in children have been attributed to shelter chill. No actual epidemics have been experienced, but trouble has arisen, here as elsewhere, from scabies.

In a large basement shelter some concrete seats were seen. Nurses sleep in this building, and when the shelters are opened, which is not until an "alert" is sounded, go to various points in the city where there are aid posts. In another very popular shelter, open all day, and with a paid warden always on duty, there were well-placed bunks and a first-aid room. Here there were chemical closets, but an endeavour is being made to get water-closets sanctioned.

In one large range of trench shelters in this area, which are occupied every night, the people sleeping on seats, large masses of cotton-wool-like fungi were noticed on the wooden walls, and the shelter seemed to be extremely damp and untidy. There were other concrete shelters near by where conditions were much better, but the people here again were erratic in their preference. In these shelters, by the way, drinking-water (chlorinated) was stored in urn-like containers, refilled once a week. Glasgow is one of the authorities with a definite "Anderson shelter policy." The Andersons are erected by the city engineers and properly drained so that they are always usable. The use of domestic communal shelters erected in gardens and yards is also being encouraged. These are lighted and fitted with Cura stoves, bunked and seated, and "let" to families or groups of families, who look after them and have their own key. They are approximately square in shape and quite roomy.

Model Medical Aid Post at Newcastle

In Newcastle-upon-Tyne there are two deep shelters, some twenty-two basements, and two surface shelters used as dormitories. Bunks have been installed in Anderson shelters, and a supply of Morrisons, several hundred a week, is proceeding. Some of the Andersons are usable, but others are said not to be, and there have been complaints of liability to flooding.

Two Newcastle shelters were visited. One was a basement under a factory. It was reinforced by concrete and had a concrete floor. It contained three sick bays, the bunks of which were ordinary ships' bunks, very comfortable, and there was all the necessary sick-room equipment. In shelters holding fifty people the sick were provided for in screened-off bunks, and in the larger shelters with 250 there were special sick bays.

Newcastle's most interesting shelter was laid down early in 1939. It has a concrete floor and bunking capacity. It is very dry, and temperature conditions are good. It has a hot-water supply, and washing-basins, fountains, and water-closets are grouped along the culvert, which is wide and high. A large seated area could be adapted for recreational purposes and a canteen. A system of alternative lighting by hurricane lamps has been installed.

Special attention was drawn here to the medical aid post in course of erection. "Hospital" would be a better description. It was claimed to be unlike anything else in the country. It includes a waiting room, a consulting room (with wash basin), and two wards, each to take six hospital beds and twelve two-tier ships' bunks. There are two water-closets, one for each ward, and two isolation cubicles with their own lavatory. There is plenty of cupboard room and a well-fitted kitchen, with hot-water geyser, sink, and draining board. Three nurses are to be attached to this post, two on duty every night, with a doctor visiting by schedule. One small room can be used as an infant feeding clinic or additional doctor's room. Newcastle has a woman warden service which is proving very satisfactory. These wardens, who are paid, work on eight-hour shifts, which enables them to get sufficient rest and attend to their homes. They are women of the "comfortable" motherly type.

Of the large provincial cities it may be said that, although the state of affairs with regard to shelters is unequal, and everywhere there is something that might be better as well as much that is very good, some of them have quite a lot to teach the London authorities. Some general comments are made in a leading article on page 443.

THE CHANGING PHARMACOPOEIA

A fourth Addendum to the *British Pharmacopoeia, 1932*—the third to be published during the war—becomes official from October 1. It contains twenty-nine new monographs and emendations of many others; a list was given in the *British Medical Journal* of September 6 (p. 351). The object of the British Pharmacopoeia Commission has been to recognize new preparations which war experience has brought to light and also to make whatever changes are possible in the interests of economy without creating unnecessary difficulties for the medical profession, pharmacists, or manufacturers. Standards have been provided for preparations to appear in the War Emergency Formulary, a compilation on which a Ministry of Health committee has been sitting since the beginning of the present year and which is at the point of completion. This committee has taken as the basis of its work the memorandum "Economy in the Use of Drugs in Wartime," prepared by the Therapeutic Requirements Committee of the Medical Research Council. Prof. J. A. Gunn, chairman of the Commission, is a member of both these committees, and Dr. C. H. Hampshire, secretary of the Commission, is secretary also of the Therapeutic Requirements Committee and a member of the committee of the Ministry of Health.

There will also be found in the new Addendum descriptions of and standards for certain chemicals formerly supplied only as proprietary preparations, several of them imported from Germany. Examples are suramin, which replaces "Bayer 205," used in the treatment of trypanosomiasis, and pamaquin, which replaces the proprietary "plasmoquin," used in the treatment of malaria. Sulphanilamide is an obvious introduction, but patent rights preclude other members of this group, such as sulphapyridine. The inclusion of digoxin, a proprietary preparation still covered by patents, indicates a relaxation of the practice excluding articles in respect of which a monopoly exists. Some changes are made owing to absence of ordinary sources of supply—for example, Indian squill in place of Mediterranean squill; alterations in the values on test of halibut-liver oil to admit oils from the Pacific coast; and the inclusion of a synthetic optically inactive menthol in view of the lack of the imported natural material from Japan and the synthetic material from Germany.

Changes in Pharmaceutical Procedure

Important changes in pharmaceutical procedure are made known in an appendix containing a revision of the methods of sterilization of solutions and suspensions intended for parenteral injection. Tyndallization, or sterilization by discontinuous heating, has been found unreliable in dealing with infective spores. The method now adopted is heating at 98-100° C. in presence of a bactericide. Bactericides specified are chlorocresol in the proportion of 0.2% or phenylmercuric nitrate 0.002%. A method of filtration is specified, but it is laid down that any solution prepared by filtration must be submitted to and comply with the tests for sterility. One of the most important of the new injections included is injection of procaine and adrenaline of 2% strength. Directions are given for sterilizing by chlorocresol, sodium metabisulphite being added as a stabilizer. No doses are given, the dosage being left to the discretion of the prescriber. Two other well-known injections now included are of sodium morrhuate and of quinine and urethane, and here again careful directions are given for sterilization by addition of chlorocresol. Injection of calcium gluconate is another new inclusion, sterilized by heating in an autoclave. A note is added that the injection must be completely free from solid particles.

Injection of nikethamide is also included as the equivalent of coramine; here sterilization may be by heating in an autoclave or by filtration. Another new preparation is solution of sodium hydroxide, introduced because of the difficulty of obtaining potassium compound. Morphine sulphate finds a place as the salt now most commonly used for hypodermic injection, morphine tartrate having fallen almost completely out of use. Sterilization of the solution for parenteral injection is by heating with a bactericide or by filtration.

Some Additions to the "B.P."

Some of the other additions may be briefly mentioned. They include mandelic and nicotinic acids, the latter indicating that the Commission is following the work on vitamins closely. Benzyl benzoate, much required in view of the increase in scabies, is inserted; also bismuth subgallate, formerly known as "dermatol," used as an antiseptic dusting powder. Ephedrine hydrochloride was already in the *Pharmacopoeia*, but the alkaloid itself is now included for the purpose of making oily preparations, sprays, and the like. Light liquid paraffin, suitable for sprays, is another new inclusion. These introductions may foreshadow the inclusion of spray solutions in the next complete volume. The War Emergency Formulary will include sprays, and it was desired by the compilers of the Addendum to furnish a standard material. Proflavine sulphate has been brought in because of the widely expressed preference for this substance as against acriflavine. It has the disadvantage of low solubility, and possibly at a later stage further improvement may be effected by the adoption of some other acridine derivative. Hydrochloride of proflavine is a much more soluble salt, but the sulphate has been known for so long that it was felt difficult to make a change. Magnesium trisilicate is now defined and standardized.

Changes for the Sake of Economy

Other new inclusions are sodium metabisulphite, chiefly used as an anti-oxidant in the preparation of solutions containing adrenaline; exsiccated sodium sulphate, the use of which it is considered desirable to encourage in preference to magnesium sulphate in wartime; and sodium lactate as a substitute for glycerin in making a kaolin poultice.

Glycerin wherever it is considered unnecessary has been eliminated. The emendations here are permissive, not obligatory; glycerin may be omitted from the compound tinctures of cardamom and of rhubarb and of ipecacuanha. Glycerin of tannic acid may now contain no glycerin: the tannic acid is dissolved in distilled water and the solution thickened with tragacanth. Syrup of wild cherry or virginian prune is made according to a modified formula with tragacanth and sweetened with saccharin. Further changes are made in mercurial ointments. A dilute ointment of mercury containing 10% of the element is now defined in addition to the ointment containing 30%.

Finally, potable water is recognized in place of distilled in making a number of preparations. This is a measure of economy because it saves cost of transport if distilled water is demanded. Moreover, storage of distilled water may give rise to difficulties in dispensing. Preparations affected by this change are aromatic waters, camphor water, chloroform water, and a large number of infusions. In view of the chlorination of water supplies and the hardness of certain natural waters, this permission will doubtless be exercised with discretion by the dispenser in order to avoid incompatibilities.

The British Pharmacopoeia Commission is to be congratulated on producing an Addendum which while meeting the war situation in various ways causes no obvious therapeutic disadvantage. It is the more praiseworthy because the work has been done notwithstanding the destruction of the Commission's offices by enemy action.

FEEDING THE CHILDREN

It is evident that a small number of well-run canteens will not solve the problem of feeding the country's children as a whole, and figures so far received by the Children's Nutrition Council[1] show that in many areas less than 5% are catered for, while perhaps only 15 or 20% of the local authorities are providing meals for one-tenth of their children. School milk schemes, on the other hand, are proceeding well in spite of occasional difficulties in obtaining deliveries at the schools. But, although consumption figures have risen higher than the best pre-war averages, there is still room for improvement. It is possible, for instance, that not more than one-third of the authorities are able to show that over 60% of their scholars have the daily third of a pint. Several areas have reported shortages of milk towards the middle and end of July. The problem of supplying milk during the holidays has been met successfully by Glasgow, where sixty-six special milk bars were opened and 40,000 children attended. Various holiday schemes have been drawn up in other areas, but in many districts the response was poor.

The National Milk Scheme, whereby expectant and nursing mothers and children under 5 are supplied free or at cheap rates, has now been operating for slightly over a year, and by last May the number of those benefiting was 2,600,000. By the end of July 73% of those entitled to take advantage of the scheme were doing so. Free milk is available where parents have a weekly income of 40s.; the qualifying scale for one parent is 27s. 6d., and 6s. is added to the scale for each non-earning dependant. At the end of July 29% of all those registered under the scheme were receiving free milk.

Milk Powder

It has been announced that dried milk powder will supplement supplies of liquid milk. This is to be dried skimmed milk imported mainly from the United States and Canada and from New Zealand, and is to be experimentally released for sale in the North-East on October 1. The available condensed milk and milk powder should equal 150 million gallons of liquid milk, bringing the total supply to an average of 100 million gallons a month, the supply in the worst months being between 70 and 80 million gallons. During the winter an adult couple should receive four pints of liquid milk a week, together with a further three pints made up from condensed milk or powder. A family of six with two under 5 and two under 17 should get twenty-five pints of liquid milk a week, exclusive of what is obtained at school. Those benefiting under the National Milk Scheme will receive their pint a day, and children up to 17 will have priority for half a pint per day in their homes. According to present decisions there is to be no strict rationing of milk, and vendors will be able to dispose of any surplus as they wish.

Advance publicity for the dried milk scheme is necessary in order that consumers shall know its properties and use. Skimmed milk is without the fat of milk and without vitamins A and D, but it should supply a valuable addition to animal protein. The Children's Nutrition Council suggests that the four chief vitamins and iron might be added to the powder. The dried milk will be issued with a warning that it should not be used for infant feeding, and it will be employed mainly for cooking. Experiments show that it does not precipitate in tea, but that it needs careful mixing when reconstituting it in liquid form. The price has not yet been fixed. The Ministry of Food believes that the novelty of the milk will protect it against a sudden demand, but the Children's Nutrition Council is doubtful whether the policy of issuing it through the retail trade without rationing is wise, especially now that the public has been warned of a possible milk shortage.

[1] *Wartime Nutrition Bulletin*, No. 12, September, 1941.

Local News

ENGLAND AND WALES

Chadwick Public Lectures

On Tuesday, October 7, at 2.30 p.m., the first lecture in the autumn programme of the twenty-ninth annual series of Chadwick Public Lectures will be given at the Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W., by Mr. V. Zachary Cope on "The Influence of War on Surgery," with Sir William J. Collins, chairman of the Chadwick Trustees, in the chair. Other lectures, all at 2.30 p.m., have been arranged as follows: October 28, at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., Mr. J. C. Dawes (Ministry of Health), "The Cleansing of Towns and Cities"; November 11, at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., Bossom Gift Lecture by Mr. F. R. Hiorns, "Hygiene Technique in Building, or the Economic, Psychological, and Health Aspects of Surface Treatment"; November 27, at Westminster Hospital Medical School, 17, Horseferry Road, S.W., Dr. S. Ernest Dore, "Advances in Dermatology during the Past Forty Years"; December 9, at the Royal Society of Tropical Medicine and Hygiene, Mrs. Blaise Gillie, "Post-war Housing in the Light of Wartime Experience."

Cancer Research in Yorkshire

The Yorkshire Council of the British Empire Cancer Campaign, which owed much of its original stimulus to the late Lord Moynihan, is continuing its work, although limited by war exigencies. The fifteenth annual report embodies an account of the work of the Department of Experimental Pathology and Cancer Research of the University of Leeds, and of the Field Laboratory of the University of Sheffield. The Field Laboratory has been improved during the year, and a new tissue culture laboratory equipped.

At Leeds Prof. R. D. Passey describes experiments following upon an American report of the experimental production of bladder papillomata by the administration of commercial β-naphthylamine, one of the amino-compounds used in the aniline dye industry. The experiment at Leeds began in August, 1937, when four dogs received 100 mg. daily of this specially purified compound. After an initial period of haematuria the dogs remained well for a year, when one male dog died from a generalized lesion resembling Hodgkin's disease, but without bladder tumours. The female has now died (after three and a half years' treatment) with extensive multiple papillomatosis of the bladder with the microscopical characteristics of malignant new growth. The two surviving dogs are in good health. This so far as it goes confirms the American work that bladder tumours are induced by purified amino-compounds. So far in America the condition has been induced in bitches only, and at Leeds also it was in the bitch that it appeared. The possible antagonism between one malignant tumour and the appearance of another in the same animal has also been investigated at Leeds, but the experiments carried out so far suggest that no such antagonism exists.

At Sheffield Prof. H. N. Green and his co-workers have been engaged in studying the complementary action of viruses and chemical carcinogens in the production of malignant mammalian tumours. Thirty-two rabbits bearing Shope papillomata were divided into three groups. One month after the appearance of the papillomata the first two groups received injections of thorotrast and methylcholanthrene respectively into the base of the warts. In the third group, which acted as control, some of the animals received injections into the warts of lead peroxide, others of sesame oil, and the remainder were not injected. Fifteen months after the inoculation with virus seven animals treated with the carcinogenic agents survived, but none of these, or of the control animals, had developed a malignant tumour, though all had either growing or stationary papillomata. This is an unusual result, as malignancy generally supervenes in Shope papillomata grown in domestic rabbits, even without interference to the warts, in a much shorter period. It is thought possible that the carcinogen modifies both virus and host cells and that the modification of either of these alone is ineffective; also that the combined application of a chemical carcinogen and material which should contain the hypothetical modified virus might result in a shortening of the latent period of tumour development. An attempt has been made to test this last hypothesis, but the experiments so far give no support to it.

Correspondence

Abortus Fever and Sulphapyridine

SIR,—I have read with great interest Dr. J. Whittingdale's letter (August 9, p. 210) describing a case of undulant fever (*Brucella abortus* infection) treated with sulphapyridine and Dr. J. H. F. Pankhurst's letter (August 30, p. 318) criticizing Dr. Whittingdale for concluding from the results in his case that "*Brucella abortus* infection responds to sulphapyridine." After reading these two letters it occurred to me that a few comments based on my series of 522 cases, of which 63 were treated with sulphonamide compounds, might be useful. Dr. Pankhurst's criticism is based upon the capricious behaviour of "a disease which is notorious for its intermissions and relapses." I agree with him that such a caution is very necessary, and I have repeatedly drawn attention to this point. Thus in an article in the *Lancet*[1] I remarked: "The rapid return of the temperature to normal followed by recovery will often tempt the doctor to ascribe this happy result to the particular treatment which immediately preceded this occurrence; but all experienced observers are agreed that such a sudden termination is common in untreated cases and should therefore be interpreted with great caution"; and again: "Cases in which afebrile and sometimes symptom-free intervals of several months or years were followed by recurrence of the typical disease without any evidence of reinfection present a difficult problem, but various considerations suggest that the *Br. abortus* may lie dormant (e.g., in the spleen or lymph glands) for long periods." My experience since writing the above has only served to confirm these views, and Table I gives a few instances in my series of striking intermissions of the fever in cases of this disease.

TABLE I.—*Intermissions of Fever in Cases of Undulant Fever*

Case No.	Intermissions					
21[2]	1st	intermission	..	..	2	days
	2nd	,,	..	..	4	,,
	3rd	,,	..	..	3	,,
	4th	,,	..	..	38	,,
	5th	,,	..	..	45	,,
	6th	,,	..	..	12	,,
217	1st	,,	..	..	37	,,
	2nd	,,	..	..	25	,,
372	1st	,,	..	..	94	,,
	2nd	,,	..	..	111	,,
398[3]	1st	,,	..	..	28	,,
	2nd	,,	..	..	23	,,
480[4]	1st	,,	..	..	4	weeks
	2nd	,,	..	..	1	week
	3rd	,,	..	..	1	,,
493	1st	,,	..	..	2	months
	2nd	,,	..	about	2	,,
504	1st	,,	..	..	59	days
	2nd	,,	..	..	3	,,
	3rd	,,	..	..	4	,,
	4th	,,	..	..	3	,,

It will be clear from these few examples that the effect of any treatment must be extremely difficult to determine in such a capricious disease, as Dr. Pankhurst aptly calls it. What criteria can we use? Obviously the return of the temperature to normal following the administration of sulphonamide compounds is insufficient in itself, as not only might apyrexia have occurred without such intervention but it may merely be a temporary intermission. The complete disappearance of symptoms is a better criterion, as most intermissions are not, in my experience, found to be completely symptomless; but this criterion is certainly not an absolute one. Again, the disappearance of specific agglutinins from the blood serum is a useful guide, but this usually takes many months or even a year or more. For practical purposes I think it is better to avoid any decision as to "cure" and to divide the cases into those in which the drug

[1] Dalrymple-Champneys, Sir W., *Lancet*, 1935, **2**, 1449.
[2] MacArthur, W. P., and Wigmore, J. B. A., *British Medical Journal*, 1930, **1**, 858.
[3] Kato, D., and Lane, C. R., *Lancet*, 1937, **2**, 77.
[4] O'Reilly, T. J., ibid., 1938, **2**, 430.

appears to have conferred definite benefit upon the patient, those in which the benefit is doubtful, and finally those in which no benefit can be detected. The category into which any case shall be put is then determined from experience, taking into account the probable course of the disease if it had remained untreated (admittedly a difficult point to determine), the duration and intensity of the treatment, the change in the agglutinin titre, and the duration of apyrexia after treatment. On these lines I have ventured to classify, as shown in the following table, the 63 cases in my series in which sulphonamide compounds were given, including the 12 cases in which the information available was insufficient to determine the efficacy of the treatment.

TABLE II.—*Results of Treatment of Undulant Fever with Sulphonamide Compounds*

Drug	No. of Cases Treated	Result			
		Definite Benefit	Doubtful Benefit	No Benefit	Insufficient Information
Prontosil rubrum ..	17	4	2	6	5
Prontosil album (streptocide, sulphonamide-P, sulphanilamide) ..	26	12	5	5	4
Proseptasine (M & B 125, 46 R.P.) ..	2	0	0	1	1
Soluseptasine	1	1	0	0	0
Sulphapyridine (M & B 693, dagenan) ..	14	4	4	4	2
Prontosil soluble (Bayer 102, rubiazol injectable) + Prontosil album ..	2	2	0	0	0
Prontosil album + Br. abortus vaccine	1	1	0	0	0

In the first column of Table II I have given the different synonyms of each compound used (for the sake of brevity I have not included the chemical names), and I would like to call attention to the confusion caused by the loose employment of these names in the descriptions of cases, a source of error from which my records are certainly not altogether free, but which I have tried to eliminate so far as possible by inquiries in cases in which I suspected misdescription. The commonest confusion is probably between prontosil rubrum and prontosil album, but others certainly occur.

As regards the proper use of these drugs in undulant fever, while fully agreeing with Dr. Pankhurst as to the dangers attending the indiscriminate and prolonged use of sulphonamide compounds, especially in children, the administration of these drugs in small quantities for a very short time, as in some of the cases in my series, cannot be expected to control the infection or to yield any information on which the value of these drugs in undulant fever can be assessed.

Finally, may I take this opportunity of appealing once more to practitioners to send me particulars of any cases of this disease which occur in their practice, for inclusion in the records which I have kept since 1928 for the Ministry of Health and the Agricultural Research Council. These records are, of course, confidential, and are used only for statistical purposes.—I am, etc.,

W. DALRYMPLE-CHAMPNEYS.

Ministry of Health, Whitehall, S.W.1, Sept. 6.

Speed in Wartime Surgery

SIR,—I have read with much interest the two articles on the clinical observations on air-raid casualties by Drs. R. T. Grant and E. B. Reeve (August 30, p. 293, and September 6, p. 329). Their conclusions, particularly with regard to shock, are of much importance, and I hope that their researches will be extended.

They have, however, described two cases which, from a surgical point of view, seem to me to call for comment. (1) A man who had a double amputation performed through the left thigh and through the right knee-joint. This was done by two surgeons working together, and it is stated that the operation "lasted only forty minutes"; about a pint and a half of blood was lost. (2) A man with a penetrating wound of the abdomen had one perforation of the descending colon, three perforations of the jejunum, and a tear in the mesentery; these were sutured, the operation lasting one hour.

Surgeons operating in France after the first year of the last war would have done the first operation without appreciable loss of blood in well under five minutes. The second operation would not have taken much more than half an hour. In peacetime, surgery, very rightly, should be done with meticulous care and without undue haste, but wartime surgery is a very different proposition. In such cases as the two described speed is essential: every minute saved may increase the chances of recovery in a badly shocked patient. Those surgeons who are doing war surgery for the first time should remember and try to emulate the dexterity and speed of our ancestors, who had to do their amputations like lightning.—I am, etc.,

Cardiff, Sept. 17. J. BERRY HAYCRAFT, F.R.C.S.

Voluntary Hospitals

SIR,—The difficulty which Sir Frederick Menzies finds in ascertaining what are those good points in the voluntary hospital system which are lacking in the municipal hospital system will be easily appreciated by those who, like myself, have worked under both. The differences in the two systems may be easily sensed but hard to define. Perhaps the following remarks may serve to emphasize a cherished feature of the voluntary hospital system—one which the medical profession is in danger of losing.

A resident house officer in a voluntary hospital is encouraged in the view that he himself is primarily responsible for his patients. Back of him are a number of senior men—registrars, consultants, etc.—whose function it is to help, advise, and instruct him. If at times his burden becomes unduly heavy their skill and experience are at his disposal to help him carry it. The mental attitude thus engendered serves to keep his keenness at its maximum.

But when he takes up work in a municipal hospital he finds that this state of affairs no longer obtains. His patients are now his in name only. The responsibility for them rests with the superintendent, whose assistant he is. The senior members of the staff, willing though they may be, are not there to be his counsellors. Their primary function is likewise to assist the medical superintendent. The medical officer may even on occasion find to his surprise that certain arrangements he has made with regard to his patient have, without his knowledge, been modified or even countermanded. He becomes conscious of that vague sense of unease which a doctor feels when he is treating someone else's patient.

The effect of this atmosphere is as subtle as it is inevitable. The medical officer finds that his sense of responsibility to himself and to his patient is being gradually replaced by a sense of responsibility to a superior officer to whom he has to surrender much of his initiative. He finds that the stimulus which once came from inside him now comes from outside; and he does his work well not because he wants to but because he must.

Thus the voluntary hospital system contains much of the essence of democracy because it procures for its medical staff the maximum of assistance combined with the minimum of interference and the minimum of coercion.—I am, etc.,

Plymouth, Sept. 8. M. R. THOMAS, M.D., M.R.C.P.

SIR,—What is the essential difference between the voluntary and municipal hospital systems? Is it something subtle and difficult to define, or is it something readily apparent? That is the question which has been asked by Sir Frederick Menzies (September 6, p. 353). It has been the subject of debate from pre-war time, in fact ever since the rapid growth of the municipal hospital has challenged the voluntary. Sir Frederick Menzies's question will, no doubt, provoke considerable discussion, as was intended. It is indeed time that the relative merits of the two systems were discussed in the open by the profession, for post-war changes will inevitably project a scheme for the unification or co-operation of the two hospital systems.

Briefly here are my observations and conclusions for what they are worth. I have spent the first four years of my post-graduate time in voluntary hospitals of high standing, and I have been resident assistant surgeon in a teaching hospital; since then I have worked in several municipal hospitals in a senior position. I have also been in general practice, so at least I have had first-hand experience.

Although the two hospital systems had different beginnings, the primary function of each is to treat sick poor in the best possible way. The voluntary hospital has a second function—to train and teach the medical personnel. The municipal hospital has no such purpose, nor does it attempt to have or encourage

such a purpose. Here lies the crux of the whole matter, for it has many repercussions. The old-established voluntary hospital system of arranging medical personnel so that the most junior medical man on the staff is responsible to another more experienced, and he, in turn, to a senior man can hardly be bettered. Such an arrangement of personnel achieves the best possible co-operation in the patients' interests, and in addition each junior member benefits from the knowledge and experience of his seniors. This system promotes free communication of enthusiasm and ideas. Such an attitude to medicine is both productive and progressive. Very different is the position of the M.O. in the municipal hospital. He is usually allocated to look after certain wards among other duties, and over these he may have complete charge. Here he can learn only from his own mistakes and experiences, the supervision, if available, being as a rule inadequate. The limitations of this method of learning depend a great deal on the ability of the doctor, but at the best it is unsatisfactory both to him and to his patients. It leads to a process which might be described as "drifting along," in which intellectual arrogance based on a small knowledge not infrequently shows itself. In addition, lack of co-operation in the accessory departments is often a prominent feature. No enthusiasm can possibly arise in such a system, or if it did it would be quickly strangled. It is this lack of willingness to learn and co-operate that renders the municipal hospital sterile. There is, of course, the question of selection of medical personnel. In view of the fact that the posts in voluntary hospitals are essentially apprenticeships, where the best facilities of learning are offered and immediate monetary gain is small, the man attracted as a rule is one whose main aim is to become a better doctor. The better pay, greater comforts, and possibility of permanency associated with the municipal hospital posts tend on the whole to draw a different type of man.

This is but a sketchy outline of the most important influences which in my opinion produce the difference in "atmosphere" between the two hospital systems. There are, of course, many other lesser factors. To mention a few—the off-duty system in the municipal hospital and the mixed nature of duties tend to cause lack of continuity in treatment and therefore indifference or lack of interest. The position of the medical superintendent requires consideration, but a discussion of it is beyond the scope of this already overlong communication. Suffice it to say that it would be an advantage to have a medical committee at which the senior member of each department would sit and some of the consultant staff.

This letter does not seem complete without my briefly putting forward a few suggestions for remedying some of the defects I have criticized in the municipal hospital system. These are:

1. The appointment of highly qualified men who have been trained in voluntary hospitals to the senior posts in the medical, surgical, and gynaecological departments; and that high salaries should be attached to these posts.
2. A team system of arranging medical personnel.
3. Monthly clinical meetings, to which outside doctors serving the district would be invited, to discuss clinical cases of interest; for the encouragement of original papers by members of the staff, and to provide lectures by specialists from other hospitals. Such societies would organize a suitable reference library and provide the important current journals.
4. If possible, arrangements for students to do three-months internships, either in vacation or as part of their clinical training.
5. A scheme for sending senior members of the staff to see other clinics at work in this country and abroad.
6. The avoidance of red tape-ism so far as is compatible with the control of the municipal authority, to allow freedom of thought and action in each department. This may seem vague, but it would be impossible to dilate without greatly extending the length of the letter.
7. The provision of first-class laboratory facilities with an enthusiastic pathologist and staff, for this is the hub around which the essential and academic activities of a hospital centre.
8. A full complement of consultant staff.

This résumé may sound Utopian in some respects, but I have had experience within recent times of most of the suggestions made. I arranged, with the co-operation of the medical superintendent, to have six students reside in the hospital during a vacation. A scheme of work in clinics was arranged for them embracing all departments, particularly stressing clinical pathology. The results were most encouraging, justified by enthusiastic students and by the senior members of the resident staff, who felt much the better for it. There is no doubt that teaching and the critical faculty of the student are the best stimulus for maintaining high clinical standards. This would also put to use the enormous amount of clinical material which has been wasted up to the present time in big municipal hospitals.

The picture I have painted of the municipal hospital may seem black. I am aware there are some in which real efforts are made to prevent the M.O.'s duties becoming just a "job of work," but this is far from being general. I myself believe that the municipal hospitals have a great future, and I am anxious to see them in such a position. It is a new hospital system and still in a transitional stage, but if they are to produce that elusive "atmosphere" enjoyed by the voluntary hospitals, and if they are to become a productive and progressive unit, then they must to some extent introduce the older-established regime in respect to medical personnel.

In conclusion I wish to point out that I have made no attempt to compare the defects and merits of both hospital systems. My object has been to show some of the reasons why the atmosphere in the municipal hospital is different from that in the voluntary, which is the question Sir Frederick Menzies has asked, and some suggestions are made for remedying it.—I am, etc.,

Sept. 10. D. LANG STEVENSON.

SIR,—In answer to Sir Frederick Menzies's question, "What are the particular virtues of the voluntary hospital system which are conspicuous by their absence in the municipal hospital system?" (September 6, p. 353), the short reply must be: power to reform themselves in the voluntary hospitals. If and when the municipal hospitals need reform it must come from outside or from above and from persons or institutions in the state of relative freedom enjoyed in the voluntary system.

Let me define a voluntary hospital in theory as a living organism in the hospital world, deriving its sustenance from the disinterested efforts of contributors, staffs, and management. It can organize and reform itself from within, which it does by the democratic method of committees of contributors, staff, and governors. Authoritarian systems live on a stock of vitality inherited or plundered from free systems and must perish from lack of inspiration unless continually nourished by the free systems.

Let the voluntary hospitals beware that they do not tamely surrender their lives, or they may find their corpses awaiting resurrection in years to come from the churches, the monasteries, and the village meeting.—I am, etc.,

Edgbaston, Sept. 16. FAUSET WELSH.

Planning for Mental Health

SIR,—Since perusing the abstract (p. 276) and leader (p. 269) in your issue of August 23, I have studied the report of the B.M.A. Committee on Mental Health, and I feel that some of the facts and figures quoted therein deserve more attention from practitioners and the general public than they have hitherto received.

One of the witnesses examined by the committee considered that 60% of the normal population of this country is psychoneurotic. Millais Culpin and Smith,[1] in an investigation of 1,000 persons actually at work in different occupations, found symptoms which interfered with their output to a greater or less extent in from 40% to 60%. As might be reasonably expected, the physically ill would show a higher proportion of mental unfitness than those who are pursuing their daily vocations. Four American physicians investigating 1,200 routine admissions to a general hospital found psychic factors in 79%, and expressed the opinion that psychotherapy would play a critical part in their recovery.[2] British observers are commonly regarded as less sensational, but there are some who have made even more startling deductions. Thus, Davies and Wilson[3] found 84% of 205 patients with peptic ulcer suffering from psychological tension; and Wittkower[4] no fewer than 37 out of 40 cases of ulcerative colitis, or 92.5%, presenting definite mental symptoms, which he grouped under the heads of obsessional, hysteric, schizothymic, and depressive. Many other somatic diseases are referred to by the committee as being associated with mental symptoms, and it is, of course, common knowledge at all psychiatric clinics that the reverse of the *mens sana in corpore sano* is undoubtedly true.

The above are among the highest percentages quoted by the committee, but, after sifting a very great deal of variable evidence,

it reaches the conclusion "that in any group of sick persons something like 30% will be found to be suffering from conditions about which it is helpful to have psychiatric advice, and a considerable proportion will be found to be in need of treatment [by a psychotherapist]." In a subsequent paragraph it emphasizes that neither doctors nor patients realize to what a great extent psychiatric treatment may relieve many unhappy and inefficient members of the community. As a natural corollary to these opinions the committee makes this further recommendation: "In view of the large number of patients among the general medical sick, apart from cases of obvious mental disease, who would benefit from psychiatric advice and treatment, every hospital, whether voluntary or municipal, general or special, which has one hundred or more beds, should include on its staff a physician in psychological medicine (or more than one in larger hospitals) whose duties should include regular visits."

Dr. Henry Harris, in his recent letter (September 13, p. 386), divides humanity into those who are chronically neurotic, psychotic, or defective, and those (the vast majority of us) who, at some time or another, have had or will have nervous complaints or temporary maladjustments. After describing what he means by the latter group, he adds, "All these are minor problems when they first arise, but the physician who fails to make a distinction between those who are permanently ill and those mentally perplexed may fail to treat the latter. Problems which might easily be solved or prevented by one or two interviews may graduate into chronic and permanent illness." He asks why there should be such discrepancies in the evidence received by the committee on the incidence of psychopathic disease, but the committee has already summed the matter up in a very few words: "The number of patients sent to hospitals is a measure not of the incidence of mental disease but of the extent to which it is recognized by general practitioners."

How far practitioners differ in their attitude towards the psychoneuroses encountered among their patients, whether complicated by physical disease or not, can be seen by further reference to the report of the committee. The Tavistock Clinic was able to treat 279 patients out of the 1,914 who applied for treatment three years ago. The doctors who sent those couple of thousand patients to the clinic stated that they would have sent four times as many if facilities for treatment had been available. On the other hand, there are physicians who maintain that they have never referred a single patient to a psychotherapist or to a psychiatric clinic. In fairness it must be admitted that many are unable to avail themselves of the services of a specialist, since there is no clinic in their neighbourhood. The map opposite page 16 of the committee's report shows vast areas of the United Kingdom devoid of such resources. Others prefer to treat their patients, *secundum artem*, with bromide bottle or sedative pill, and if they genuinely believe that is the best treatment for the psychoneurotic their views are worthy of all the respect due to tradition and practice over many centuries.

But there is still another group to whom you refer in your editorial, Mr. Editor—those who regard us with a good deal of suspicion and prejudice! They must form a large group, if you consider that they are able to discourage a potential psychotherapist from embarking on a psychiatric career. Can nothing be done to convert them from their intransigent attitude towards a form of treatment which strives only to reach the same goal as the practitioner—the welfare of his patient? The committee has devised a practical and workable scheme for the rehabilitation of the mentally unfit; but to obtain its full measure of success it will require not merely a large number of trained psychotherapists, but also the support and co-operation of the entire medical profession, and in particular the general practitioner.—I am, etc.,

C. LODGE PATCH.
Lieut.-Colonel, I.M.S. (ret.).

Shrewsbury, Sept. 17.

REFERENCES

1 "The Nervous Temperament" (1930). Rep. Industr. Health Res. Bd. Lond. No. 61.
2 *Amer. J. Psychiat.*, 1939, **95**, 1319.
3 *Lancet*, 1937, **2**, 1353.
4 *British Medical Journal*, 1938, **2**, 1356.

Future of Medical Education

SIR,—As a biologist I should like to be allowed to comment on the two very interesting articles on the future of medical education (September 6, pp. 323 and 327). It is very encouraging to read that such an eminent authority as Prof. J. A. Ryle thinks so highly of the value of biology as the foundation of the medical student's work. We biologists have, of course, always been of this opinion, but I believe that in the past this view has not been so strongly held by some medical men.

From my experience as a teacher and as an examiner for the First M.B., I am convinced that Prof. Ryle is right when he states that the student should not enter on his medical course till he is 17, for I have found that students younger than that make little progress until they are more mature. These young students, even if they have matriculated, would do far better continuing at school and completing their general education, concentrating especially on those subjects which they are likely to drop when they begin their First M.B. course. I believe that too many students begin chemistry and physics too early at school, with the result that they go over the same stuff again and again without any profit to themselves. Except in the very elementary form of general science, these subjects can well be left until later, and the time might be more profitably devoted to arts subjects, so that when the student begins his pre-medical work he has a background of general knowledge and can express himself simply and clearly in English. This time might also be partly spent in the study of foreign languages such as French and German, which are much easier to learn at that age than later. If students were to concentrate on these cultural subjects at school, we might avoid what is now a common experience of many examiners, who find that the powers of expression by medical and other students are often crude. Far too few have any idea of the proper use of our language.

Biology may well be taught during the school period, but I am of the opinion that the schools might be well advised to leave the First M.B. teaching to the universities and medical schools, where facilities for such teaching are better and the course can be covered in a year. School biology should be of a much more general type, less anatomical and with the emphasis on the modes of life and habits of animals and plants. This can be done especially well in schools, particularly by those in the country, where there are greater opportunities for field work and the training thereby of the powers of observation. In other words, the work is more of the type that used to be called "natural history." It is at this stage that the student can obtain the sound knowledge of oecology such as is desired by Mr. Donald McDonald, leaving the comparative anatomy and more detailed biology to the First M.B. course. I do not think that Mr. McDonald's suggestion that the comparative anatomy should be studied simultaneously with human anatomy is either practicable or desirable. Surely the generalized comparative anatomy is the introduction to the pure human anatomy, as the elementary physiology taught in the biology course is the foundation of the later human physiology.

Mr. McDonald's proposal to include such things as human heredity in the First M.B. course would overload it, especially as the student would not at that stage be in the position to realize its importance and significance. Most medical schools and universities have biologists on their staffs; why could they not be used to give a few lectures on some of the more advanced applications of biology to students who have gone some way on their clinical work?—I am, etc.,

C. C. HENTSCHEL, M.Sc.,
Senior Lecturer in Zoology.

Chelsea Polytechnic, Sept. 15.

Communal Feeding in Schools

SIR,—Apparently Dr. Letitia Fairfield (September 6, p. 359) is very angry with me, but I hope she won't allow her wrath to obscure her judgment or close her mind to realities.

Despite her letter I still think compulsory and universal school dinners the best means available and the most economical for ensuring satisfactory nutrition in our school children. There is no doubt that they can be provided more cheaply than a similar meal at home and at a cost within the means of most parents, so why Dr. Fairfield thinks they should appreciably increase the taxpayer's burden I don't know, for necessitous cases form only a small percentage of the whole, and teaching cookery is already a charge on the cost of education. Certainly family allowances, which she seems to favour, will cost the taxpayer far more, and then he will have no guarantee that the money will be spent on the children. From my own experience I can say that the children in most need of it are least likely to get it.

It is nonsense to pretend that the success of the public school system depends on the social background of its pupils and makes all the difference between the actual and feared results of communal feeding. If the public schools are closed after the war it will be because of financial stringency and not because of psychological or other defects. As to their dysgenic effects on the nation, of course the cost of educating children at public schools must limit their production. However, if the nation wants more children it will have to pay for them, and not only for those who go to public schools. But a high birth rate does not seem the remedy for widespread unemployment and frequent wars, and until these are cured by other means parents will be prudent in their production of babies.

Dr. D. W. Winnicott (p. 358) admits that "voluntary communal feeding of children can be successful, not only physically but also in regard to emotional development." Why he thinks the results should be worse if made compulsory and permanent is not easy to see. Perhaps it is one of those "things in heaven and earth not dreamt of in my philosophy." But let me assure him that I am not indifferent to "complications arising out of feelings, fantasies, and superstitions," though I beg leave to doubt that any serious complications of this nature need be feared from school dinners. I have seen no sign of them at our own school dinners. In fact, our backward and "difficult" children have shown marked improvement mentally as well as physically after a course of school dinners. A little mental as well as physical buffeting is good for children by helping to prepare them for the much greater stress and strain they will have to face when earning their own living.

Undoubtedly a small percentage of the children evacuated have suffered serious emotional upset from evacuation to strange homes and strange people, but they form a surprisingly small part of the total. In any case, emotional disturbance arising from evacuation cannot be compared with any slight upset which might arise from compulsory attendance at school dinners, though why this should cause any more mental trauma than compulsory attendance at school for lessons is not clear. Furthermore, exceptional children could be excused, but they should not be allowed to stand in the way of a provision which would benefit the majority.

To sum up: 11% of our school children are obviously undernourished. How many are suffering from deficient diets we don't know, but Sir John Orr's National Survey published in 1936 suggests that roughly half the population subsist on diets which are deficient in some or all important constituents. Compulsory school dinners appear to be the only satisfactory solution of the nutrition problem in sight. No homes need be burnt down to provide them, and maternal relief is more likely than maternal depression.

But fancy all this ado and dark foreboding over an hour longer in school and a meal less at home. It makes one wonder how much of it is prompted by genuine anxiety for the welfare of the mothers and their children.—I am, etc.,

Gosport, Sept. 8. G. W. FLEMING.

A Simple Technique of Intravenous Infusion

SIR,—The following modified method of fixing a cannula in a vein for the purpose of infusion or transfusion has been found successful, and it seems worth while making a brief note of the technique, as the call for intravenous infusion is such a frequent happening in these days.

After cleaning and anaesthetizing the skin, a small oblique incision is made over the vein instead of the usual transverse one. Exposure of the vein is effected by the beak of a haemostat in the usual way. A careful dissection of the vein from its surrounding fascia is unnecessary. A curved cutting needle is threaded with a strand of silkworm gut and is now passed through one skin edge, beneath the vein and out through the outer skin edge. The ends of the suture are caught in a haemostat and traction is exerted in order to obstruct the venous flow. With a pair of sharp-pointed scissors a small longitudinal nick is made opposite the silkworm suture in the anterior vein wall and the cannula quickly inserted. The suture is tied round the vein and cannula. The suture now fulfils three functions: it occludes the vein, it keeps the cannula in position, and it closes the skin incision.

After conclusion of the infusion the suture is cut, the cannula quickly withdrawn, and a new skin suture inserted to close the wound, which is covered with a sterile dressing and bandage. As a prophylactic measure against sepsis sulphanilamide powder should be rubbed into the wound before tying the suture. The longitudinal cut in the vein will heal, and, as the vein is not ligatured, the circulation has a good chance to become re-established and the vein could be used again at a later date.

It will be seen from this brief description that this technique economizes in movements, time, and material, a single strand of silkworm gut being the only suture necessary. The whole procedure takes little more than a minute to perform. It is in these respects that this method has certain advantages over those mentioned in textbooks.

I wish to thank Mr. D. Lang Stevenson, F.R.C.S., for his help in trying out this method.—I am, etc.,

Romford, Essex, Sept. 4. E. FRANKEL.

"Perfect Sight without Glasses"

SIR,—As you rightly point out in your annotation on this subject (September 13, p. 383), the whole treatment of defective sight by exercises is based on fallacy. The answer to Dr. J. Parness's inquiry (p. 389) is, therefore, as follows: No degree of ametropia is cured by the exercises of Bates or any of his brethren, and those who seek this treatment hoping to give up glasses which they genuinely need will be disappointed.

However, in this country the majority of the population buy their glasses from "practitioners" who have no medical knowledge, and it follows that there are thousands of us who are wearing glasses unnecessarily. If one such should fall into the hands of a Bates practitioner, a "cure" will result, but it should not be necessary to go to a second unqualified practitioner to be told that the glasses provided by the first were unnecessary from the start.

If the Bates treatment is given to a person who genuinely needs glasses, then at the worst he is a sadder, wiser, and poorer man. But where it is given to patients whose headache or defective vision is due to general causes—perhaps renal or intracranial—then the delay caused by the treatment may well have a disastrous result. If only for this reason it seems a pity that Dr. Huxley should have given it a free advertisement.—I am, etc.,

London, W.1, Sept. 15. SEYMOUR PHILPS, F.R.C.S.

SIR,—Benjamin's book is, of course, complete nonsense, but it appeals to the belief in magic latent in so many apparently modern rational people. As only those with no useful work to do in the world have time to devote to this particular magic, not much is lost to society if such persons do leave off their reading-glasses. If myopic they will still see to read, and so can discuss their magic "cure" in complete honesty of belief.

The world's workers will continue to use glasses when necessary to get on with their job with the least possible strain. Glasses do not, of course, cure hypermetropia, myopia, or astigmatism. They simply relieve the strain involved in trying to concentrate on close work with eyes which are out of focus.

The only people to whom Benjamin's otherwise comic book could do any harm, if its advice is followed, are those suffering from glaucoma, iritis, and corneal ulcers, in which cases failure to recognize and treat the disease properly leads inevitably to serious loss of vision or blindness. In this the book is on a par with many other systems of quack cures—e.g., a fairly well-known system of "curing" cataract without operation. This system labels all its clients as cases of cataract, and "treats" chronic glaucoma, retinal haemorrhages, etc., with complete impartiality by means of enormously strong convex glasses, by the aid of which the victim is encouraged to read for so many hours a day. As a further aid the lenses are tinted a most convincing green. How, then, can they fail to "cure"? I imagine that this system does much more positive harm than Benjamin's book.

I have known numbers of patients who have tried to follow Benjamin's precepts, but have yet to encounter a single "cure." They all relapse and go back to their glasses. I lent the book some years ago to a man with slowly progressive cataract. He

dreaded the thought of operation, and for two years he faithfully carried out the whole rigmarole of exercises, dieting, etc., advised by Benjamin. He lost a lot of surplus fat, but his cataracts progressed as steadily as the waves climbed the shore on which King Canute sat of old, till finally he had to be led about by his wife. Now he is in the Home Guard; alas! not thanks to Benjamin's magic, but to "orthodox medical science," in accordance with which he got 6/6 vision (with glasses) after the crude method of surgical extraction of first one and then the other cataract. His temper, which had steadily worsened under Benjamin's treatment, has also improved, until now his wife says he is quite human again. For one of his temperament Benjamin supplied quite a useful occupation until it was time to operate.

Like all its predecessors, Benjamin's book will fade out in time, to be replaced by other "latest discoveries" in magic cures. An infallible rejuvenator of sclerosed arteries began life as a lotion guaranteed to grow a thick thatch on the baldest scalp.

We affect to despise the ignorant belief of the African native in his witch doctor, and yet how many people read and believe their favourite astrologer in one or other of the Sunday papers?—I am, etc.,

Bournemouth, Sept. 14. DAVID HARDIE.

The Spread of Poliomyelitis

SIR,—In an annotation in your issue of August 30 (p. 311) you refer to the findings of Burnet and Jackson that after oral infection in *Macacus irus* "the mesenteric lymph nodes almost always contain the virus in such large amounts . . ." In this connexion the work of Burrows (*Arch. intern. Med.*, 1931, **48**, 33) is of interest. Burrows investigated the pathology of poliomyelitis in 50 fatal cases, concluding that the nervous involvement was only a rare complication in a widespread infectious disease, and that the name "infantile paralysis" was misleading, since it described what was only an occasional complication. He suggested that the name "acute lymphatic hyperplasia" would accord better with the pathological findings.

In experiments by Yoffey and Sullivan (*J. exp. Med.*, 1939, **69**, 133) attention was drawn to the part played by lymph nodes in the diffusion of vaccinia virus in rabbits. Virus from a primary nasopharyngeal focus of infection reaches the regional lymph nodes and multiplies there (cf. McMaster and Kidd, *J. exp. Med.*, 1937, **66**, 73). But it does not remain confined to these nodes, for we were able to show that a constant stream of virus leaves in the efferent lymph and enters the blood. Furthermore, the mechanism by which virus leaves the node so readily appears to be very simple. The virus becomes fixed by the lymphocytes, and it is these lymphocytes, normally leaving the node in large numbers, which convey virus to the blood stream. Once in the blood, virus-containing lymphocytes would appear to be able to leave the blood capillaries in any part of the body, including the central nervous system.

If this mode of spread held good for the virus of poliomyelitis also, it would afford a simple and attractive explanation of the way in which virus could reach the central nervous system from infected mesenteric lymph nodes. However, in actual experiments with *Macaca mulatta* we (Yoffey and Drinker, *J. exp. Med.*, 1939, **70**, 83) were unable to find poliomyelitis virus in cervical lymph after nasal instillation of virus which did ultimately reach the central nervous system and give rise to paralysis. Furthermore, the disease could not be produced by injecting the virus into lymph nodes. It was felt that a virus which was very specifically neurotropic would not perhaps flourish in lymph nodes, and the conclusion was drawn that "the strain of virus employed does not spread by way of the lymphatic vessels and nodes." Burnet and Jackson's finding of virus in mesenteric lymph nodes so frequently and in such large amounts suggests that this conclusion may not be true for other possibly less specifically neurotropic strains of virus, and that our experiments may be well worth while repeating with such strains.—I am, etc.,

J. M. YOFFEY.

Department of Anatomy, University of Bristol, Sept. 17.

Ship Surgeons and Doctors on Military Transports

SIR,—A copy of the *Journal* of June 14 came my way recently at a certain port of call, and I can thoroughly endorse the views expressed by Dr. James Prendergast on page 904 regarding the position of ship surgeons and their relations with the medical personnel on H.M. transports. Speaking with experience in both connexions during the war of 1914-18, as well as this, it grieves me that the R.A.M.C. especially still plays the old game of putting square pegs in round holes, and there is still now in 1941 the same occasional friction that was so noticeable twenty-five years or so ago. King's Regulations so far as troopships are concerned require revision. For instance, the title S.M.O. makes an invidious distinction and, as so frequently happens, the position is given to a junior officer whose only claim to seniority lies in the fact that his subordinates joined up, it may well be, only a matter of a week or two after he did. In my last ship, for example, the senior medical officer of the two appointed to that vessel was a lad of 26 who had had no previous experience to speak of either at sea or on shore, whereas his junior had had seven years' experience, partly as a ship surgeon, but mostly as a resident medical officer of a fairly large municipal hospital, to his credit, but had not been gazetted till a fortnight after the other. I will say this for the junior, that he was loyalty itself, and that his young senior was wise enough to rely in great measure upon his more proficient colleague. But it does not always work out so by any means. They were busy enough when there were troops on board, but were completely at a loose end when, as so often happened, the ship was empty. This was simply waste of material. On one recent voyage from North India to the Levant, when this S.M.O. was left behind because of illness and the junior automatically became S.M.O. and there were also seven or eight I.M.S. officers, including a major, it was I, the crew's doctor, who was called upon to make an exhaustive analysis of the ship's drinking-water. Before complying I notified the ship's commander that a complaint had been made and obtained his ready assent. Incidentally, the O.C. Troops knew nothing of the affair until it was over and done with. That, however, was not my pigeon.

During the last war on one voyage when I was temporarily in the R.A.M.C. I had charge of some 1,500 prisoners of war. I was called upon for six weeks to act as ship surgeon as well. On another occasion, when a free lance, I was ship surgeon on a transport ferrying American troops across the Atlantic; I had the whole ship to look after what time the U.S.A. doctors were all down and out. True it was only for three days, but I had my hands full.

Finally I may say that in a pretty lengthy experience I have never had the faintest difficulty with officers of the R.N. or the R.A.F., and that it is the ship surgeon's own fault if he permits himself to be overridden, especially by the macrocephalic type one encounters from time to time. When there is real danger, little differences vanish.—I am, etc.,

Aug. 15. ATHELSTANE NOBBS, M.D.

Air-raid Noises in Psychotherapy

SIR,—The classical allusion in my letter of August 16 (p. 243) has evidently put Dr. J. H. Mellotte off the point of my criticism and led him (September 6, p. 354) into a very fallacious mode of reasoning. I have no doubt that, as he claims, the intentions of the authors of the criticized article, Majors McLaughlin and Millar, were excellent and that their aim was to conserve available man-power. But good intentions, it should be obvious, are not enough to excuse a particular form of therapy. Otherwise they would justify osteopathy, nature cures, Christian Science, and every other type of treatment that professed the same aims.

To put forward, as Majors McLaughlin and Millar did, "oversensitiveness" to noises as an explanation of a psychological disorder, and "conditioning" by gramophone records as the appropriate treatment, is surely impressive as a conception far short of the scientific attitude. It is equivalent to "explaining" claustrophobia as an oversensitiveness to closed spaces and treating the patient by conditioning him to progressively smaller rooms. The marks of regression are visible upon the whole procedure, but it may be that Dr. Mellotte will be able to link it up with his use of "parergasic" as a serious contribution to psychotherapy. "Parergasic"! What a horror of a word, anyway. I assure Dr. Mellotte that there are plenty of expressive words that could validly be applied to his line of argument, in Anglo-Saxon, not in Meyerian terminology.—I am, etc.,

London, W.1, Sept. 12. FREDERICK DILLON.

Obituary

DAVID R. ROWLANDS, M.D., F.R.C.S.Ed.

Consulting Physician, Birmingham and Midland Skin Hospital

We regret to announce the sudden death on August 28 at his home at West Kirby of Dr. David R. Rowlands. A distinguished skin specialist, he had been associated with the Birmingham and Midland Skin Hospital for forty years.

David Richard Rowlands, born at Oswestry in 1871, was the son of a veterinary surgeon. He began his studies in 1891 at Edinburgh University, where he had a brilliant record as a student, being thrice a medallist during his course. He graduated M.B., Ch.B. with honours in 1896 and later became demonstrator of anatomy, gaining his F.R.C.S.Ed. in 1899. On completing his studies, Dr. Rowlands went to Swansea Hospital as house-surgeon and later as house-physician. When he left the hospital he prepared his thesis for the M.D., his subject being ectopic gestation. On setting up in Five Ways, Birmingham, he met with instant success as a general practitioner, and in 1901 he joined the staff of the Birmingham and Midland Skin Hospital as clinical assistant. Later he became senior honorary physician and held that post until 1936, when he reached the age limit. He was then appointed consulting physician, and a few months later the board of management marked his long association with the hospital by presenting him with a silver salver and his portrait in oils. The portrait now hangs permanently in the board room. Dr. Rowlands made valuable contributions to the methods of combating occupational dermatitis and was associated with the provision and development of many special facilities at the hospital for combating skin diseases. He insisted on the need for an enlarged hospital; and it was a fitting tribute to his many years of service that in 1935 the in-patient hospital in Edgbaston was opened, followed by a remodelling of the original hospital for the use of out-patients.

About ten years ago he went to live at Oswestry (retaining his Birmingham practice), and latterly he removed to West Kirby, where patients still sought him, and he was unable to enjoy a full retirement. He was a Fellow of the Royal Society of Medicine, a member of the British Medical Association for forty-one years, and of the Midland Medical Society; and after his many lectures to the St. John Ambulance Association was appointed an honorary life member.

Dr. WILLIAM ROBERTSON, who retired from the post of medical officer of health for Edinburgh in 1930, died on September 7. A native of Leith, he studied medicine at Glasgow University and the Anderson College, graduating M.B., C.M. in 1887 and proceeding to the M.D. in 1891. He obtained the D.P.H. of the Royal Faculty of Physicians and Surgeons of Glasgow in 1893, and the F.R.C.P.Ed. in 1923. Before his appointment as head of the health administration of Edinburgh in 1923 he had been M.O.H. at Perth and at Paisley; he was appointed M.O.H. for Leith in 1904, and continued in office there after the amalgamation of the port with Edinburgh. At Paisley he organized the water department with much success, and at Leith he was energetic in combating outbreaks of smallpox and of plague, for which he received public thanks from the Scottish Board of Health. In Edinburgh, where he had lectured for some years on public health at the Royal Colleges of Physicians and Surgeons, he was responsible for the very popular health exhibitions in Waverley Market, and thus brought before the eyes of thousands of citizens the value of personal and public hygiene and the range of civic effort in the department which he administered. Dr. Robertson was the author of *Sanitary Law and Practice* for students reading for the D.P.H., and of handbooks on meat and food inspection and on practical first aid.

News reaches this country of the death of Dr. ALEXANDER WILLIAM FORRESTER, late medical officer of health for Bulawayo. A student of the Royal College of Surgeons in Ireland and the Carmichael College, Dublin, he took the Scottish triple qualification in 1893 and the D.P.H. later. He went out to Rhodesia in 1897, and had been there long enough to know everyone in the Colony. He served throughout the last war as medical officer of a Rhodesian native regiment with the rank of major, and received the French Croix de Guerre with palms and was mentioned in dispatches. After the end of the war he was Government medical officer and M.O.H. for Bulawayo, retiring in 1930. At the beginning of this war Dr. Forrester offered his services to the Colony, and despite his age—a few months short of 70—he was appointed medical officer to No. 2 Training Centre. He had been a member of the British Medical Association since 1904, was joint honorary secretary of the Rhodesian Branch, 1922-6, and honorary secretary of the Bulawayo Division 1922-5. One of his friends writes: "In common with thousands of other Rhodesians I have lost a real comrade by the death of Major A. W. Forrester. He was too much a lover of humanity in general to be an outstanding 'parade-ground soldier,' but as a kind, sympathetic, and understanding medical officer he excelled, and his friendly smile and the merry twinkle in his eye were in themselves a tonic to his patients when he appeared in the wards. He was universally loved by all who knew him, young and old, European and native, patients and colleagues. He was certainly 'the youngest old man' in Rhodesia, for apart from his years he was by no means an old man, and if anybody in Rhodesia was entitiled to be called 'everybody's friend' it was Major Forrester. His death leaves a vacancy in the whole of Rhodesia which will probably never be filled. Major Forrester, his wife (who predeceased him by only a few weeks), and their only son—Harding Forrester, the Rhodesian novelist—were a particularly devoted family, popular everywhere."

We regret to announce the death of Dr. CHARLES E. P. FORSYTH, who practised in recent years as a physician at Newport, Monmouthshire, after his return from India. He studied medicine at Aberdeen University, graduating M.B., Ch.B. in 1899, and took the M.R.C.P.Lond. in 1903 and the D.P.H. of Liverpool in 1909. Dr. Forsyth's early appointments were those of assistant medical officer in the Fever Hospital Service of the Metropolitan Asylums Board, house-physician and senior resident officer at the Bradford Royal Infirmary, and pathologist in the research laboratories of the Liverpool Hospital for Consumption. He joined the British Medical Association immediately after graduating and took an active part in the local work of the Association during his time in India. He served as honorary secretary of the Assam Valley Division 1923-5, and had been honorary secretary and president of the Assam Branch, representing it at the Annual Meetings of 1924 at Bradford and 1925 at Bath. At Newport Dr. Forsyth was appointed honorary physician and physician in charge of out-patients to the Royal Gwent Hospital and consulting physician to the Newport Mental Hospital, and held the post of medical referee to a number of assurance companies. He was the author of several papers in the *Indian Medical Gazette* and in the *Proceedings* of the Assam Branch of the B.M.A.

The following well-known medical men have died abroad: Dr. WILLIS COHOON CAMPBELL, professor of orthopaedic surgery, University of Tennessee College of Medicine, and author of several works on orthopaedics, aged 60; Dr. FRANK CLINCH HAMMOND, who was appointed in 1925 editor of the *Atlantic Medical Journal*, predecessor of the *Pennsylvania Medical Journal*, aged 66; and Dr. THOMAS A. WOODRUFF, past-president of the Chicago Ophthalmological Society and author of *Common Diseases of the Eye*, aged 75.

There is evidence to show that the consumption of flour is rising, but it is possible that the extra quantities are being used for cakes and biscuits, which are greatly in demand in industrial areas, rather than for bread itself. A bulletin issued by the Children's Nutrition Council advocates that in any case the additional flour consumed should be of the wheatmeal variety, and also that biscuits, slab cakes, and confectionery should be reduced to a small number of simple varieties and rationed on the "group" basis, with priority for war workers and heavy manual labourers (and perhaps also for persons between 12 and 18). A start has already been made in reducing the varieties of chocolate and sugar confectionery.

The Services

HONORARY PHYSICIAN TO THE KING

Major-General P. S. Tomlinson, C.B., D.S.O., late R.A.M.C., has been appointed Honorary Physician to the King in succession to Major-General R. W. D. Leslie, C.B., O.B.E., late R.A.M.C., who has retired.

R.N.V.R. OFFICERS' DECORATION

The King has awarded the Royal Naval Volunteer Reserve Officers' Decoration to Surgeon Commanders Thomas Weir Drummond, Harold Oliver Martin, and Hugh Edwin Hall, R.N.V.R.

AIR FORCE AWARD

The George Medal has been awarded to Group Captain J. A. Gray, D.F.C., and to Acting Squadron Leader Joseph Aidan MacCarthy, M.B. The announcement in the *London Gazette* of September 9 reads as follows:

"One night in May, 1941, the pilot of an aircraft attempted to land with the undercarriage retracted. The aircraft crashed into the main bomb dump and then burst into flames. Group Captain Gray and Squadron Leader MacCarthy immediately went to the scene of the accident. Although there was some delay in getting the fire tender to the spot, owing to wire entanglements at the bomb dump, Group Captain Gray and Squadron Leader MacCarthy entered the burning aircraft and between them succeeded in extricating two members of the crew who were trapped. By the time the first man had been extricated the fire had spread from the starboard tanks to the cabin and on to the port tanks. Ammunition, incendiaries, and flares were burning in the wreckage, whilst numerous explosions erupted from the tanks. In spite of this an attempt was made to rescue the pilot, who was still trapped at the bottom of the fuselage. He was dragged clear, but his harness still held him to the burning aircraft. Before he could be released another petrol tank burst and flames spread to such an extent that any further attempts to rescue him became impossible. Group Captain Gray and Squadron Leader MacCarthy were assisted by two other officers, who both displayed great courage in their efforts. Group Captain Gray received severe burns on his head and his uniform was destroyed, but he continued his efforts until overcome by the fumes. Squadron Leader MacCarthy suffered minor facial injuries caused by burns but, despite this and the strain to which he had been exposed, he would not retire to his quarters until he was satisfied that everything possible had been done for the comfort of the injured. Both Group Captain Gray and Squadron Leader MacCarthy displayed great bravery in the most appalling circumstances."

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Commander ROBERT WALLACE NESBITT, R.N., lost his life on active service this month. He was the son of the late Mr. Alexander Nesbitt of Dalkey, Co. Dublin, and was educated at the University of Dublin, where he qualified L.M., L.Ch. in 1918. Five years later he took the degrees of M.B., B.Ch., B.A.O. of the University, and in 1928 obtained the F.R.C.P.I. He entered the Royal Navy as surgeon lieutenant in 1921, was promoted to surgeon lieutenant-commander in 1924, and to surgeon commander six years later. He had been a member of the British Medical Association since 1928.

ROYAL ARMY MEDICAL CORPS

The name of War Substantive Captain SAMUEL BERNARD GREENBERG is included as "Died" in an Army Council casualty list published on September 18. He was educated in South Africa and took the degrees of M.B., B.Ch. of the University of the Witwatersrand, Johannesburg, in 1930. He was house-surgeon and house-physician at Johannesburg General Hospital, and in 1931 became assistant medical officer at the Springs Mines in the Transvaal. He came to this country in 1935, and in the following year settled in practice in Bath. Soon after the war began he was granted an emergency commission as lieutenant in the R.A.M.C. and was promoted to captain last year. He had been a member of the British Medical Association since 1929.

Lieut. RICHARD MENNIE, who died on September 13, was the only son of Mr. James Mennie, J.P., and Mrs. Mennie of Golspie, Sutherlandshire. He was educated at the University of Edinburgh, where he graduated M.B., Ch.B. in 1927, proceeding M.D. five years later. He had held appointments at the Liverpool Heart Hospital and Chester City Hospital and for a time was in practice at Bradford and later at Liverpool. He was granted an emergency commission as lieutenant in the R.A.M.C. about a year ago.

Prisoners of War

Temporary Major David Livingstone Charters.
Captain James Edward Scott Carmichael.
Captain John Emmerson Gray.
War Substantive Captain Thomas Ion Victor Ferguson.
War Substantive Captain Francis Laurence Gerard Malone.

SOUTH AFRICAN MEDICAL CORPS

Dr. WILLIAM NEIL CAMPBELL, who has died while on active service with the South African Medical Corps in the Middle East, received his medical education at the University of Edinburgh, where he was a member of the rugby XV, and graduated M.B., Ch.B. in 1927, proceeding M.D. in 1939. He was elected a Member of the Royal College of Physicians of Edinburgh in 1935. Dr. Campbell acted as house-physician at Edinburgh Royal Infirmary in 1927-8, before returning to Durban, where he became honorary physician to the King Edward Hospital in 1937. He had been a member of the British Medical Association since 1927.

DEATHS IN THE SERVICES

Major-General JOHN MACFARLANE SLOAN, C.B., C.M.G., D.S.O., late R.A.M.C., died at Ifield on September 10, aged 69. He was born on July 22, 1872, the son of Samuel Sloan, M.D., and was educated at the University of Glasgow, where he graduated M.B., Ch.B. in 1898. Entering the R.A.M.C. as lieutenant in 1899, he became major in 1910, received a brevet as lieutenant-colonel in 1915, and was promoted to colonel in 1923 and major-general in 1926, retiring in 1929. He served as adjutant to the Territorial Army from 1908 to 1911. He served throughout the South African War of 1899-1902, when he took part in the defence of Ladysmith, in operations in Natal, the Transvaal, and the Orange Free State, was mentioned in dispatches in 1902, and received the Queen's medal with four clasps and the King's medal with two clasps, and the D.S.O. In the war of 1914-18 he served as A.D.M.S. of Indian Expeditionary Force D in 1916-17, and as D.D.M.S. of the Third Indian Army Corps in Iraq in 1917-19, was mentioned in dispatches six times, and received the C.M.G. In 1927 he was made a C.B. He leaves a widow. At the funeral at Crawley on September 13 the Director-General, Army Medical Services, was represented by Brigadier M. J. Williamson.

Universities and Colleges

UNIVERSITY OF DURHAM

Frederick John Nattrass, M.D., F.R.C.P., has been appointed to the Chair of Medicine tenable at the Medical School, King's College, Newcastle-upon-Tyne, from October 1.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—L. A. Westwood.

FINAL M.B., CH.B.—*Part II:* A. M. Bowler, S. Keidan, Bertha Klempman, E. O. Lawton, J. Lees, D. Levi, J. Lyons, Kathleen M. Packett, C. Reichman, B. Sidman, G. H. Templeman, Jean M. Terry Thomas, D. Velinsky, L. Walsh, J. L. C. Ward, A. Wertheimer.

The West Riding Panel Practitioners' Prize has been awarded to D. L. Richardson.

The medical officer of health for Bury, in submitting his annual report for the year 1940, points out that the estimated population of the borough for that year was four or five thousand less than it had been since 1919, and that this fact would tend to raise such figures as the birth and death rates, and tuberculosis and cancer death rates. In spite of this the tuberculosis death rate was the lowest ever recorded in the borough, being 0.42 per 1,000 population; the cancer death rate, in contrast, was 2.37 per 1,000, the highest so far recorded. Only one maternal death was recorded during the year, the rate being 1.32 per 1,000 total births, a low figure when compared with the general death rate of 17.54 per 1,000 population. This good result may be attributed to the excellent attendance at the ante-natal clinics. At the time of writing the report 3,061 children had been immunized against diphtheria, and as a result only 13 cases were notified in 1940, and there was only one death.

No. 36

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 6.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	128	7	23	1	7	107	9	39	2	1
Deaths		1	1				1	1		
Diphtheria	820	48	234	21	24	929	38	350	30	34
Deaths	17	—	5	—	1	36	—	9	—	2
Dysentery	66	6	49	—	—	57	4	57	—	—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	3	—	—	—	—	2	—	1	—	—
Deaths		—	—				—	1		
Enteric (typhoid) fever*	46	15	8	7	8	126	4	18	3	—
Deaths	2	2	—	—	—	—	—	—	—	—
Erysipelas		—	42	4	6		16	42	6	4
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	41	4	19	27	5	46	7	13	10	9
Measles	944	30	12	46	2	5,949	140	362	—	26
Deaths	3	—	—	2	—	8	—	1	1	—
Ophthalmia neonatorum	71	5	12		—	93	4	16		—
Deaths										
Paratyphoid A and B	182	8	10	—	—					
Deaths	2	—	—	—	—					
Pneumonia, influenzal†	407	12	3‡	1	4	371	30	3	—	4
Deaths (from influenza)	3	14	2	1	6	11	—	1	—	1
Pneumonia, primary			144	12				117	4	
Deaths		—		5	—		20		7	6
Polio-encephalitis, acute	3	—	—			4	—	—		
Deaths		—					—			
Poliomyelitis, acute	29	1	6	2	1	42	2	3	—	1
Deaths		—	—				—	—		
Puerperal fever	1	1	17	4	—	2	2	13	1	—
Deaths										
Puerperal pyrexia	116	8	19		2	148	11	20		—
Deaths										
Relapsing fever	1	—			—	1	—			—
Deaths										
Scarlet fever	956	34	184	39	10	1,449	54	163	29	32
Deaths	1	—	—	—	—	1	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	3,029	238	185	40	2	1,055	12	78	—	28
Deaths	18	2	3	3	1	2	—	1	1	1
Deaths (0–1 year)	300	28	57	48	20	315	41	52	22	16
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,680	481	527	205	115	4,576	801	504	157	115
Annual death rate per 1,000 persons living			11.5	13.6	§			10.2	10.5	10.1
Live births	4,846	432	811	379	225	5,436	801	797	259	219
Annual rate per 1,000 persons living			16.5	25.2	§			16.1	17.3	19.2
Stillbirths	150	6	32			207	20	28		
Rate per 1,000 total births (including stillborn)			38					34		

* Includes paratyphoid A and B for Eire and Northern Ireland.
† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
‡ Cases of pneumonia not otherwise notifiable.
§ Owing to evacuation schemes and other movements of population birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of the Table

A further fall in the notifications of measles in England and Wales occurred during the week. The decrease of 168 cases, compared with the total of the previous week, is the smallest decline in the incidence of this disease during the past ten weeks. The number of cases of whooping-cough in England and Wales was 144 fewer than in the preceding week, but a relatively large rise was recorded in Scotland. The city of Glasgow contributed 159 of the 185 notifications. The incidence of diphtheria showed a slight increase in both countries for the fourth consecutive week.

A further 15 cases were reported from the outbreak of dysentery in Bristol C.B., and this area accounted for approximately one-quarter of the cases in the country.

During the week reviewed 128 cases of cerebrospinal fever were notified in England and Wales, an increase of 30% on the total of the preceding week. The increase was due to the general rise in the incidence of the disease experienced by the northern counties and Wales.

Typhoid and Paratyphoid

The outbreak of paratyphoid fever in Bristol C.B. contributed a further 48 cases during the week, making a total of 170 cases during the three weeks August 17 to September 6. The cities of Liverpool, 20 cases, and Birmingham, 8 cases, were the only other areas in the country with a relatively large number of cases of paratyphoid. A third of the total cases of typhoid in England and Wales was recorded in London, 15.

Poliomyelitis

After poliomyelitis had fallen from 30 to 23 cases a week during the preceding four weeks a relatively large increase of 6 cases was recorded. The notifications of poliomyelitis (29) were widely distributed, involving twenty counties. The largest number reported from any registration area in England and Wales was 2. These areas were: Berkshire, Maidenhead M.B. ; Buckinghamshire, Aylesbury M.B. ; Dorset, Wimborne and Cranborne R.D. ; Lincolnshire, Lincoln C.B. Three of the 6 cases reported in Scotland were notified in Glasgow. Both of the cases in Eire were recorded in the rural district of Ruthdown, Co. Wicklow.

Medical News

A meeting of the Society of Public Analysts and Other Analytical Chemists will be held at the Chemical Society's Rooms, Burlington House, Piccadilly, W., on Wednesday, October 1, at 3.45 p.m., when papers will be presented on "The Determination of Traces of Mustard Gas in Contaminated Foodstuffs and Other Commodities" by H. C. Lockwood, Ph.D., and "A Rapid Method for the Determination of Terpinyl Acetate and Other Esters" by Miss H. M. Perry, M.Sc., and T. F. West, Ph.D. Several chemists interested in war gas detection will exhibit pieces of apparatus which may be of use in micro-analysis.

At the Central Middlesex County Hospital, Acton Lane, N.W.10, on Thursday, October 9, at 3 p.m., Dr. W. Pagel will give a demonstration (lantern slides) of some cases observed in the pathological department of the hospital, 1939-41.

The issue of the *Edinburgh Medical Journal* for September (Oliver and Boyd, 4s.) is a special education number. It opens with a short paper on the future of postgraduate teaching by Dr. James K. Slater, and the last twenty-eight pages are devoted to medical education in Scotland, with particulars of the medical curriculum at the Universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews, and the qualifications given by the Scottish Colleges.

Lady Louis Mountbatten, now visiting the United States of America as official representative of the British Red Cross, has conveyed to Mr. Norman Davis, chairman of the American Red Cross, the thanks of this country for medical supplies and clothing, amounting to over $25,000,000 in value, sent to Britain.

Dr. Freda B. Pratt of Oxford has changed her name by deed poll to Dr. Freda B. Bannister.

It was announced by the B.B.C. on September 22 that the Prime Minister has asked Sir Charles Wilson, M.D., President of the Royal College of Physicians of London, to join the British Mission to Moscow in order to report to him on any medical help that should be given to Russia.

An American Red Cross Mission is now in Russia for the purpose of assessing that country's medical and other relief needs. The American Red Cross has already sent to Russia a shipment of medical and surgical materials, including insulin and gas gangrene serum. Additional emergency supplies are being prepared for shipment. The chairman of the Mission is Mr. Allen Wardwell of New York, who was a commissioner of the American Red Cross in Russia during the last war. Other members of the Mission are Mr. James D. Nicholson, Dr. George K. Strode (Assistant Director of the International Health Division of the Rockefeller Foundation), and Mr. Robert K. Scovell.

At the end of a Polish-Czechoslovak medical conference held recently in Edinburgh a resolution was unanimously adopted calling on physicians of the two countries to carry on in friendly collaboration. At a dinner given to the guests of the congress, Prof. Koskowski, vice-chairman of the committee, thanked the Scottish authorities for their hospitality and co-operation, and expressed gratitude to the Royal College of Surgeons of Edinburgh for the readiness with which it had helped the committee in getting accommodation. The Czechoslovak Minister of Social Welfare emphasized the medical and social importance of the congress. The scientific proceedings included the presentation of reports on questions from various fields of medicine, with special reference to professional work in wartime.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.
ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.
TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.
TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Income Tax

Assessment and Allowances

"SENEX" completed a return for 1940-1 claiming relief in respect of bank charges, building society interest, etc., and showing £136 professional earnings. The inspector of taxes says he accepts this figure and that "it will be necessary to submit an assessment" in that amount. Nothing has been said about the claim to relief.

*** Presumably the official writing the letter was dealing only with the question of the assessment of the earnings, and he will arrange for the assessment to be made accordingly. No doubt the return will be passed on to some junior official to deal with the relief claimed, but if "Senex" does not hear shortly on that aspect of the matter he might inquire what is being done about it.

Remuneration as Assistant

A. E. held a hospital appointment up to January 14, 1940; he then took an assistantship at £400 per annum, which he held until he took another similar employment as from July 14, 1940, at £500 per annum. (Car allowance and value of board and lodging are excluded as not being liable to tax.) What is his liability to assessment for 1940-1 and 1941-2?

*** Continuity of employment applies to the two assistant appointments, but not to that at the hospital. *1940-1.*—This is the second year of the employment assessed, and the remuneration is chargeable on the current year's basis—i.e., on 86/365 of £400 (=£94) plus 279/365 of £500 (=£382), net total £476. The assessment of £475 can therefore be accepted. *1941-2.*—This, being the third year of the employment, is chargeable on the basis of the previous year, unless the person assessed claims the current year's basis. The liability is therefore £475, and notice of objection to the assessment of £500 should be given. As regards expenses, renewals of books and instruments can be claimed, but not commissions paid for obtaining appointments.

LETTERS, NOTES, ETC.

Very Hyphenated

A correspondent who attended the recent annual congress of the Ophthalmological Society at Cambridge brings back one example of a term used by a speaker there in a discussion on nystagmus which seems worth preserving. It was "Laryngo-pharyngo-palato-oculo-diaphragmatic myoclonus."

The Evacuation Scheme

"PRO SINE QUID" writes: During the past two years many changes of billets have taken place and large numbers of children have trickled back to their homes. Others have transferred from one doctor to another in the same area not once, but as often as they change their billets. In some cases children have moved miles away, and the doctor with whom they originally registered is still called in although they are miles outside his area. The doctor receives no notification of changes in his list, and he is not infrequently called in to attend later arrivals and confronted with a blank card for children who have been living in his area for a year or more, whose guardians or foster-parents have not troubled to register them with a doctor until they become ill. The result of all this is that I for one have not the slightest idea of my commitments nor of any changes which have taken place in my list. With petrol allowance nearly halved so that I cannot take any new patients, and with the increased cost of purchase-taxed drugs still rising, I should like to know how I stand. Please note that I am saying nothing about the question of remuneration, which so far as I am concerned appears to have ceased more than a year ago.

Rose-hip Jam

The following method has been suggested by the Children's Nutrition Council for using wild rose hips (a rich source of vitamin C) as a jam or purée. Pick the fruit after the first frost, and choose deeply red, ripe, but slightly soft berries, which should be cut from the stalks with a sharp knife or scissors and processed immediately, care being taken that they do not come into contact with metal, unless stainless. Take whole hips, snip off the stalks and withered buds, and wash quickly. Place in a clean enamel saucepan, cover with boiling water (using 1¼ pints to 2 lb. of fruit), and boil for a quarter of an hour only. Rub through a fine sieve of hair or stainless metal, using a wooden spoon. Mix 2 lb. of the purée with 1 lb. of sugar and stir well. Dissolve and bring to the simmer. Boil for ten minutes and fill small earthenware containers. Allow the jam to cool and cover the tops with a half-inch layer of fine sugar. Cover with cellophane or the like, and keep in a cool place. The vitamin content will be retained for three or four months. According to a bulletin issued by the Children's Nutrition Council, the purée should contain about 160 to 600 milligrammes of vitamin C per 100 grammes, and the jam about 130 to 230 milligrammes. Thus there should be at least three 50-milligramme doses of ascorbic acid in slightly over three ounces of jam; half an ounce eaten daily with bread would provide a useful supplement to the vitamins obtained in a normal diet. It is interesting to note that rose hips are a traditional food of European peasants.

"Perfect Sight without Glasses"

Dr. D. OCKMAN (Kearsley, Lancs) writes: The annotation on the subject of perfect sight without glasses (September 13, p. 383) is very interesting. It is well known that the vocal apparatus can be trained to extend the range of a voice in both directions, and I should have thought that it would not be impossible to train the optical apparatus to behave with increased physiological power. The chief difficulty, as I see it, would be to find patients with the credulity, patience, and will-power required for the discipline involved. It is so much easier to put on a pair of glasses, just as it is so much easier to take atophan than to give up port and purins.

Medical Certification

A correspondent has received the following ingenuous note from one of his patients: "Dear Dr. S.,—Will you kindly give me a prescription for glucose? My wife wants some for preserving, but I can't get it without a prescription from a doctor.—Yours sincerely, ——."